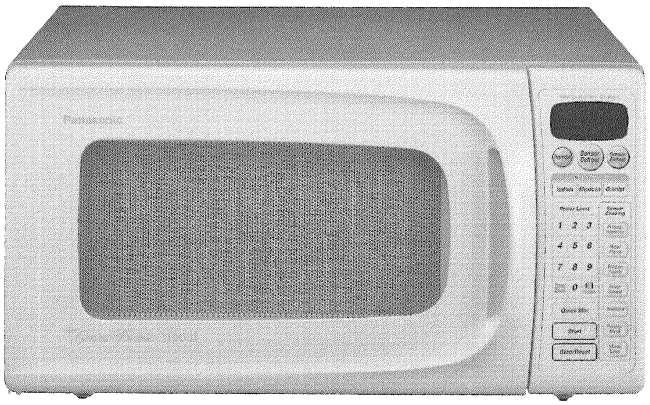
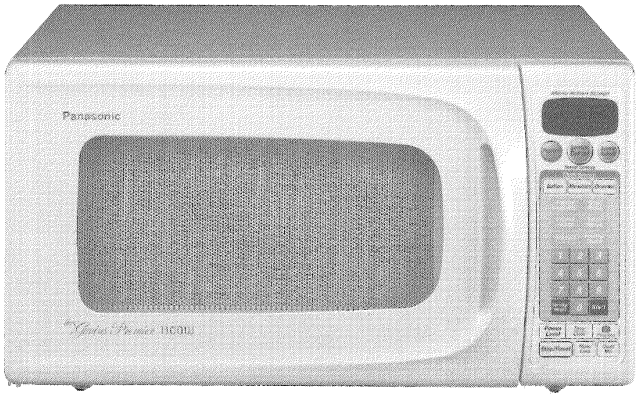
ORDER NO. MMOC9804049C1
E1

Service Manual

Microwave Oven



NN-N698BA/WA



NN-S698BA/WA

MODELS	APH	CPH
	USA	CANADA
NN-N698BA	○	—
NN-N698WA	○	—
NN-S698BA	○	—
NN-S698WA	○	—
NN-S698BC	—	○
NN-S698WC	—	○

Specifications:

Models:	NN-S698BC/WC	NN-N698BA/WA, NN-S698BA/WA
Power Source:	120 V AC Single Phase, 60 Hz	120 V AC Single Phase, 60 Hz
Power Requirements:	1500W (13.0A)	1600W (14.0A)
Output: (IEC705-88)	1000W	1100W
Microwave Frequency:	2,450MHz	2,450MHz
Timer:	99 min. 99 sec.	99 min. 99 sec.
Oven Cavity Size:	1.3 cu. ft.	1.3 cu. ft.
Outside Dimensions:	21 7/8" (W) X 16 3/4" (D) X 12" (H) 555mm (W) X 425mm (D) X 306mm (H)	21 7/8" (W) X 16 3/4" (D) X 12" (H) 555mm (W) X 425mm (D) X 306mm (H)
Inside Dimensions:	14 15/16" (W) X 15 13/16" (D) X 9 1/8" (H) 380mm (W) X 402mm (D) X 232mm (H)	14 15/16" (W) X 15 13/16" (D) X 9 1/8" (H) 380mm (W) X 402mm (D) X 232mm (H)
Weight:	38 lbs/17.2 kg	38 lbs/17.2 kg
Output power: IEC705-88 Test procedure		
Specifications subject to change without notice		

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

WARNING

1. This product should be serviced only by trained qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J" (D.H.H.S.): U.S.A. models
   or "Radiation Emitting Devices Act" (Health and Welfare Canada): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage".
4. If the unit cannot be repaired on site, advise the customer not to use until unit is repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

IN U.S.A. (PASC)	Panasonic Services Company 50 Meadowland Parkway, Secaucus, New Jersey 07094 Attention: Technical Service Division. (201) 348-7000	IN PUERTO RICO (PSC)	PSC San Gabriel Industrial Park 65th Infantry Ave. Km.9.5 Carolina, Puerto Rico 00985 (787)750-4300
		IN CANADA (PCI)	Panasonic Canada Inc. 5770 Ambler Drive, Mississauga, Ontario, L4W2T3 (905) 624-5010

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced only with the manufacturer's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.
(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   (1) Interlock operation
   (2) Proper door closing
   (3) Seal and sealing surfaces (arcing, wear, and other damage)
   (4) Damage to or loosening of hinges and latches.
   (5) Evidence of dropping or abuse
(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.
(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

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FEATURE CHART

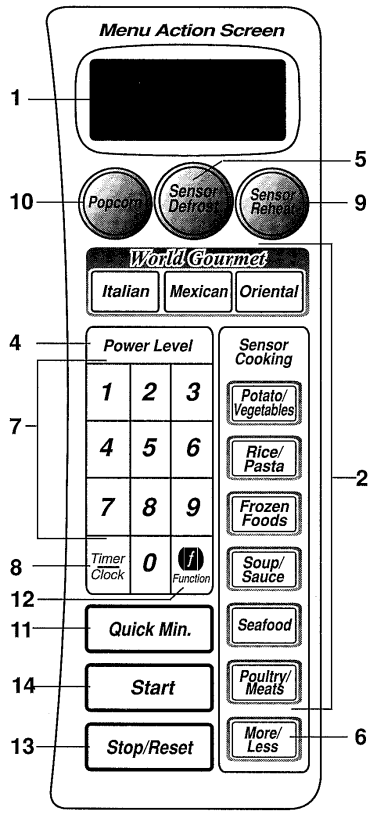
FEATURES	USA Models	Canadian Models
	NN-S698BA/WA NN-N698BA/WA	NN-S698BC/WC
Three Stage Cooking	○	○
Sensor Reheat	○	○
Sensor Defrost	○	○
Auto Cooking Display #	○	○
Popcorn	○	○
Quick Minute	○	○
More/Less	○	○
Child Safety Lock	○	○
Display Mode Operating Guide	○	○
Delay Start	○	○
Timer	○	○
Digital Clock	○	○
Function Key	○	○
Sensor Cooking (World Gourmet)	○	○

NOTE: The Function Key allows the user to select the following features:

1. Language choice
2. Lb/Kg choice
3. Word speed
4. Menu Action On/Off
5. Child Lock On/Off
6. Beep On/Off
7. Reminder Beep On/Off
8. Daylight Saving On/Off
9. Clock On/Off
10. Demo Mode On/Off

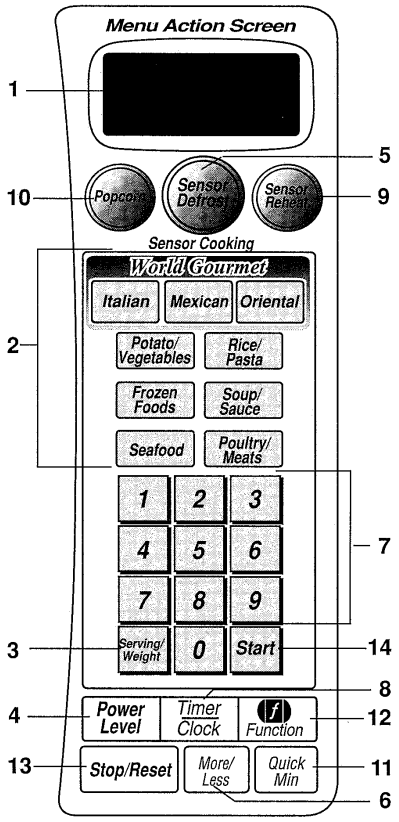
(Refer to Operation on Page 7.)

CONTROL PANEL
NN-N698BA/WA

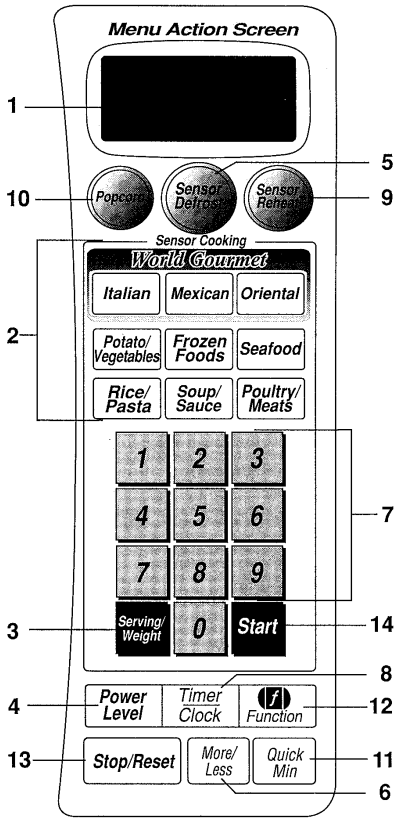


CONTROL PANELS (Cont'd)

***NN-S698BA/WA**



***NN-S698BC/WC**



1 Display Window
2 Sensor Cook Pads
3 Serving Weight Pad
4 Power Level Pad
5 Sensor Defrost Pad
6 More/Less Pad
7 Number Pads
8 Timer/Clock Pad
9 Sensor Reheat Pad
10 Popcorn Pad
11 Quick Minute Pad
12 Function Key
13 Stop/Reset Pad

Before cooking: One tap clears your instructions.
During cooking: One tap temporarily stops the cooking process. Another tap cancels all your instructions and time of day appears in the display window.

14 Start Pad

One tap allows oven to begin functioning. If door is opened or STOP/RESET Pad is pressed once during oven operation, START Pad must again be pressed to restart oven.

Word Prompters

When pads are pressed, a beep sound is heard and the corresponding letter or word(s) appear and roll across the window. If a pad is pressed and no beep is heard, the unit does not or cannot accept the instruction. As each pad is pressed the corresponding word(s) roll across the window. Words will automatically appear to prompt the user to perform the next step. It is not necessary to wait for the words to appear before pressing pads for the next step. A two beep sound is heard between stages. At the end of any complete program, the oven will beep five times and "ENJOY YOUR MEAL" will appear in the display window.

* Easy operation of this control panel is accomplished by blinking or illuminating next step key highlighting on the LCD keyboard.
The control panel is assembled by sticking the LCD keyboard onto the membrane keyboard.

OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

Operation Guide on the display:
To assist you in programming, the next operation will appear on the display. When you get used to operating the oven, you can turn off the operating guide.

To turn off:
Press 3 times

Timer | OPERATING GUIDE OFF

To Turn on:
Press 3 times

Timer | OPERATING GUIDE ON

1. To Set Clock

OPERATION	SCROLL DISPLAY
1. Plug the power supply cord into wall outlet.	*WELCOME TO PANASONIC —REFER TO OPERATING INSTRUCTIONS BEFORE USE* :
2. Press Timer/Clock pad twice. (Number keys 0 thru 9 will blink.)	✳ ✳ *——SET TIME*
3. Enter time of day (TOD) by pressing appropriate Number pads.	*11✳25* *——PRESS CLOCK PAD*
4. Press Timer/Clock pad. TOD has now been registered into the digital programmer circuit and will count up by minutes.	*11:25*

OPERATION	SCROLL DISPLAY
5. Set for 1 minute by pressing Number pads. 1 min. = 1 0 0 (Start pad will blink.)	*1 00* *MIN SEC* *——PRESS START* *MEDIUM*
6. Press Start pad. 1st stage cooking begins as time counts down.	↻ *5* *sec*
7. When 1st stage cooking time has elapsed, oven beeps twice and automatically switches to 2nd stage cooking.	↻ *1 00* *MIN SEC*
8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off.	*ENJOY YOUR MEAL*

2. Time Cooking for Two Stage

OPERATION	SCROLL DISPLAY
1. Place a water load in the oven.	
2. Press Power Level pad once to set High power. (1st stage) (Number keys 0 thru 9 will blink.)	*HIGH* *——SET TIME*
3. Set for 5 seconds by pressing Number pad. 5 sec. = 5 (Start pad will blink.)	*5* *SEC* *——PRESS START* *HIGH*
4. Press Power Level pad 4 times to set Medium power. (2nd Stage) (Number keys 0 thru 9 will blink.)	*MEDIUM* *——SET TIME*

3. Auto Weight Defrost

OPERATION	SCROLL DISPLAY
1. Press Sensor Defrost pad. (Start pad will blink.)	*SENSOR DEFROST* *——PLACE FOOD ON DEFROST RACK* *——SET WEIGHT*
2. Press Start pad. Sensor Defrost cycle begins.	↻ *AUTO*
3. Press Stop/Reset pad twice. Oven shuts off. Time of day or colon appears in the display.	*11:25*

4. Popcorn (NN-S698BA/BC/WA/WC)

OPERATION	SCROLL DISPLAY
1. Press Popcorn pad once. (Serving/Weight pad blinks.)	*POPCORN* *——PRESS SERV/WEIGHT*
2. Press Serving/Weight pad. (Select 3.5, 3.0 or 1.75 oz.) (Chose 3.5 oz.) (After selection, Start pad blinks.)	*3.5 OZ* *——PRESS START*
3. Press Start pad. Cooking begins as time counts down.	2 MIN 20 SEC
4. When cooking time has elapsed, Oven beeps 5 times and shuts off.	*ENJOY YOUR MEAL*

4. Popcorn (NN-N698BA/WA)

OPERATION	SCROLL DISPLAY
1. Press Popcorn pad once for 3.5 oz. serving.	*POPCORN* *3.5 OZ* *—— PRESS START*
2. Press Start pad. Cooking begins as time counts down.	2 MIN 20 SEC
3. When cooking time has elapsed, Oven beeps 5 times and shuts off.	*ENJOY YOUR MEAL*

5. Sensor Cooking

OPERATION	SCROLL DISPLAY
1. Pour 150 ±15cc (4.5±1/2ozs) of room temperature water in a beaker, place the beaker in the center of the oven.	
2. Press the desired Sensor Cooking Category pad. e.g. Set Seafood (Start pad blinks.)	*FISH FILLETS* *——PRESS START*
3. Press Start pad.	AUTO
4. The steam sensor detects steam about 1.5 to 4 minutes after the Start pad is pressed. Sensor cooking (T1) automatically switches to time cooking (T2). "Auto" disappears with beep sounds and the remainder of cooking time appears in the display window. NOTE: Cooking time will vary depending on the water temperature, the shape of the beaker or the power source voltage.	32 SEC 1 MIN 32 SEC
5. When the balance of cooking time has elapsed, oven stops and beeps 5 times.	*ENJOY YOUR MEAL*

Functions

This unique feature of your PANASONIC microwave oven allows you to establish the initial non-cooking features of your oven such as CHILD LOCK, WORD SPEED, LANGUAGE CHOICE (ENGLIGH, SPANISH OR FRENCH), plus many more. See below.

1 **LANGUAGE CHOICE**
The oven has English, French and Spanish display. The display appears in English when you plug-in.
1 ENGLISH → Display appears in English.
2 FRANCAIS → Display appears in French.
3 ESPANOL → Display appears in Spanish.

2 **Lb/KG CHOICE**
The oven has both imperial and metric weight measurements. The oven displays the weight in imperial when you plug it in.
1 Lb → Weight can be set in lb/oz.
2 KG → Weight can be set in g/kg.

3 **WORD SPEED**
The speed of word scrolling in the display window can be quickened or slowed down.
1 QUICK → Words scroll quickly.
2 MEDIUM → Scrolling speed reverts to initial setting.
3 SLOW → Words scroll slowly.

4 **MENU ACTION ON/OFF**
MENU ACTION SCREEN helps you to program your oven by prompting the next step to be taken. When you become familiar with your oven, the prompting can be turned off.
1 ON → Prompting Guide will reappear.
2 OFF → Prompting Guide will not appear.

5 **CHILD LOCK ON/OFF**
The oven has Child Safety Lock feature which prevents use by children.
1 ON → Child Lock has been set and operation will not be accepted.
2 OFF → Child Lock has been cancelled.

6 **BEEP ON/OFF**
If you wish to have the oven operate with no beep, it can be eliminated.
1 ON → Beep sound will activate.
2 OFF → Beep sound will not be heard.

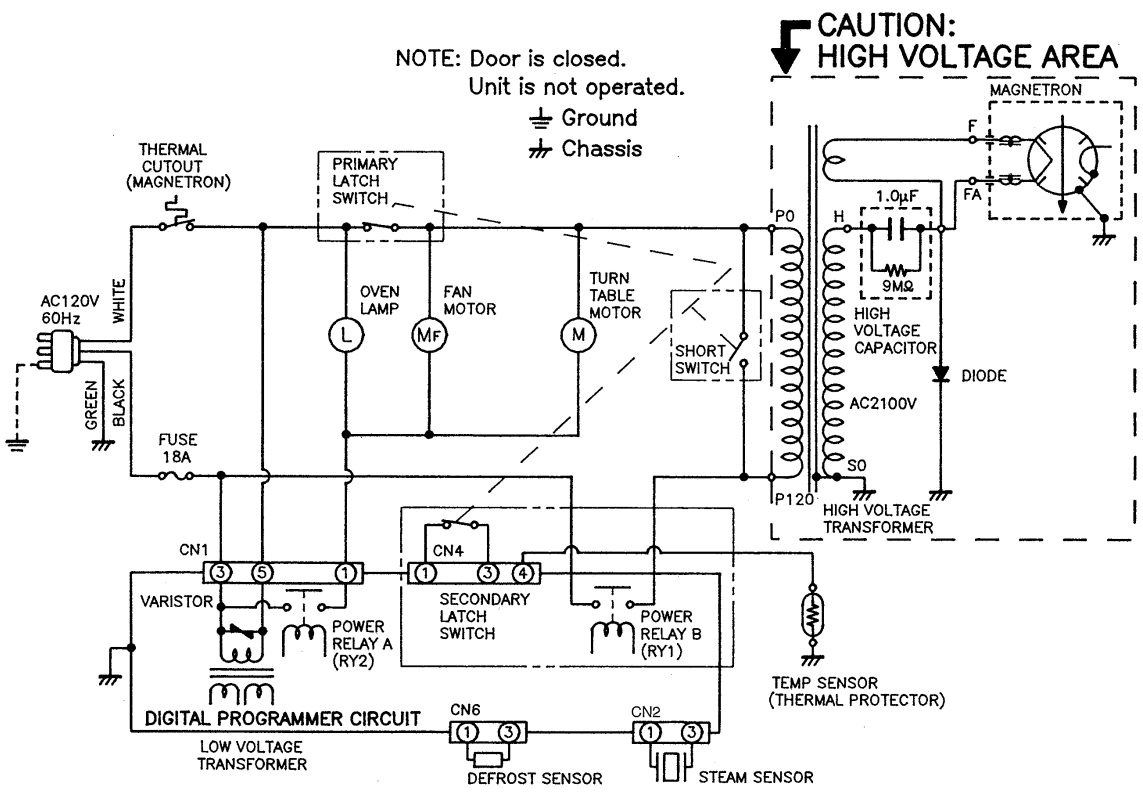
7 **REMINDER BEEP ON/OFF**
A reminder beep works to remind you to remove the food from the oven after the completion of cooking. It will occur every few seconds.
1 ON → Reminder beep will work.
2 OFF → Reminder beep will not work.

8 **DAYLIGHT SAVING ON/OFF**
1 ON → Time of day will be one hour fast.
2 OFF → Time of day will revert to original setting.

9 **CLOCK ON/OFF**
Clock display can be turned off.
1 ON → Clock display will appear in the display window.
2 OFF → Clock display will not appear in the display window.
Time of day will not be lost while the display is off.

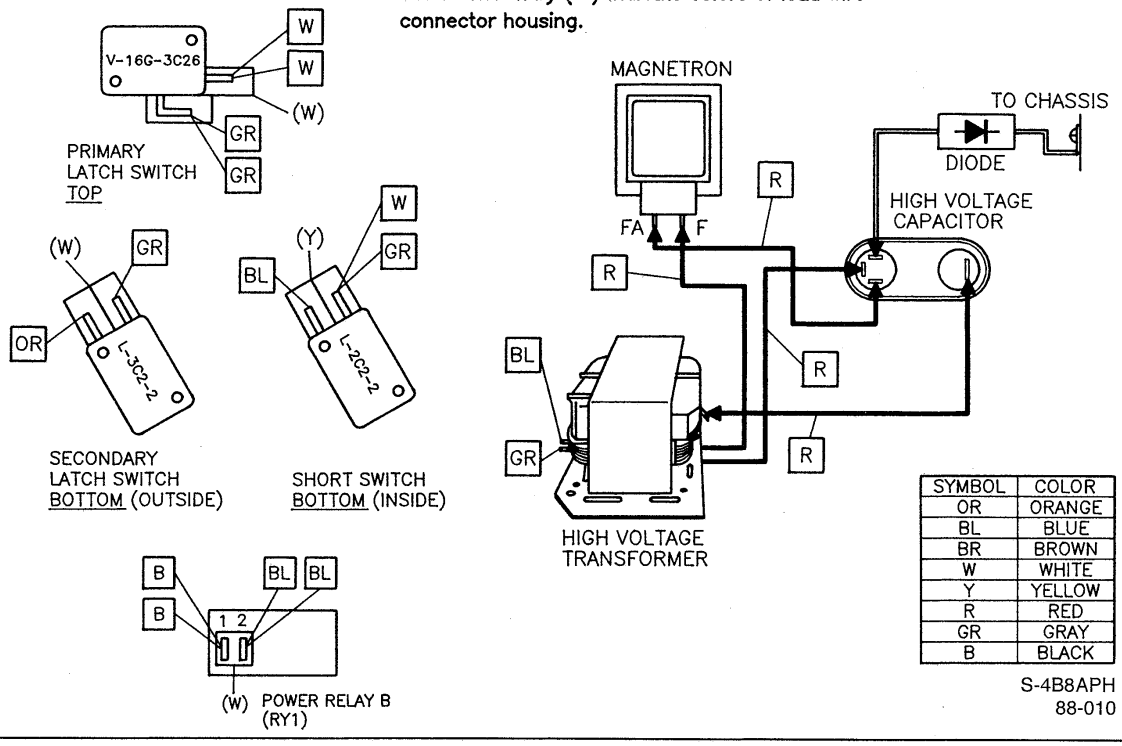
0 **DEMO MODE ON/OFF**
Demo mode is designed for retail store display. In this mode, the oven can be demonstrated with no power in the oven.
1 ON → The oven will be in demo mode.
2 OFF → The oven will be out of demo mode.

SCHEMATIC DIAGRAM (APH)



WIRING DIAGRAM

NOTE: *When replacing, check the lead wire color as shown.
*Colors shown by ( ) indicate colors of lead wire connector housing.



SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

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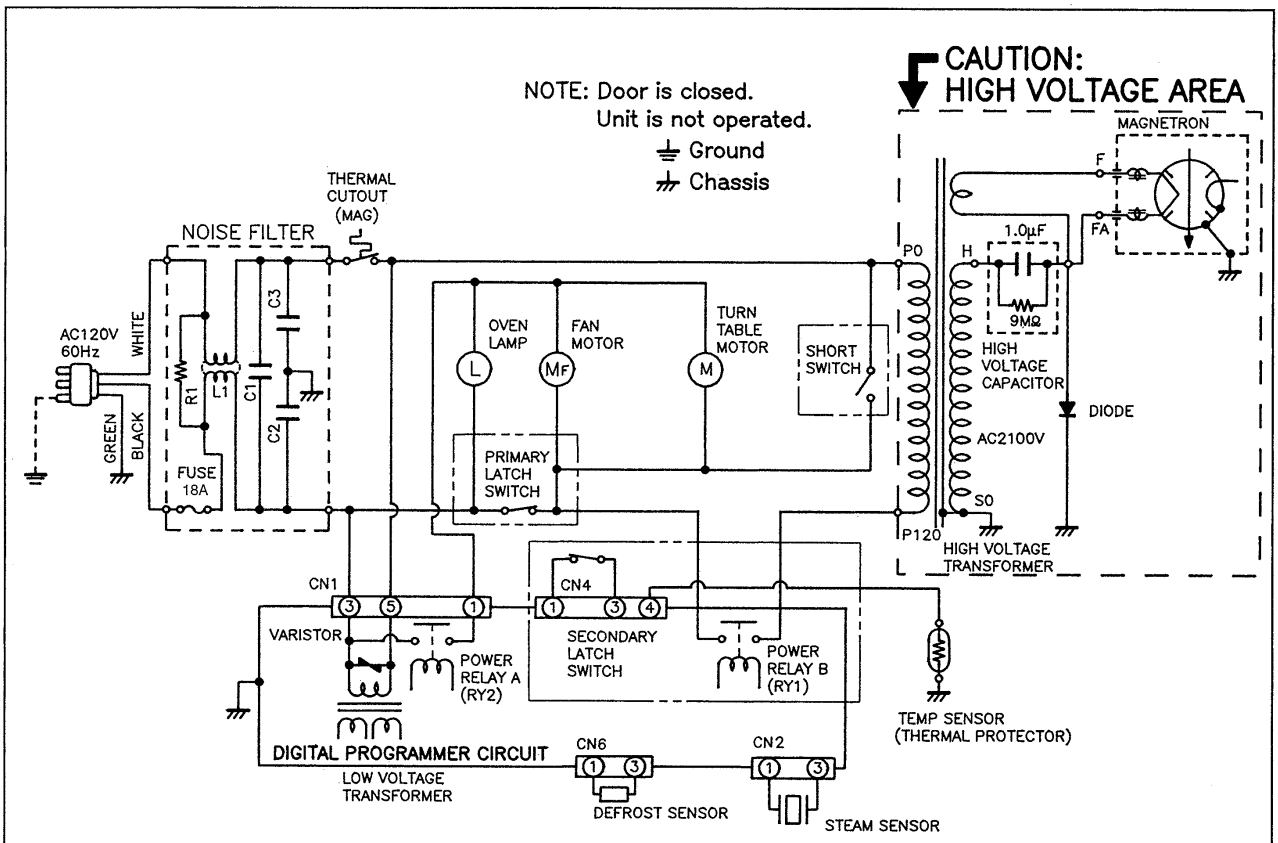
SCHEMATIC DIAGRAM (CPH)



WIRING DIAGRAM

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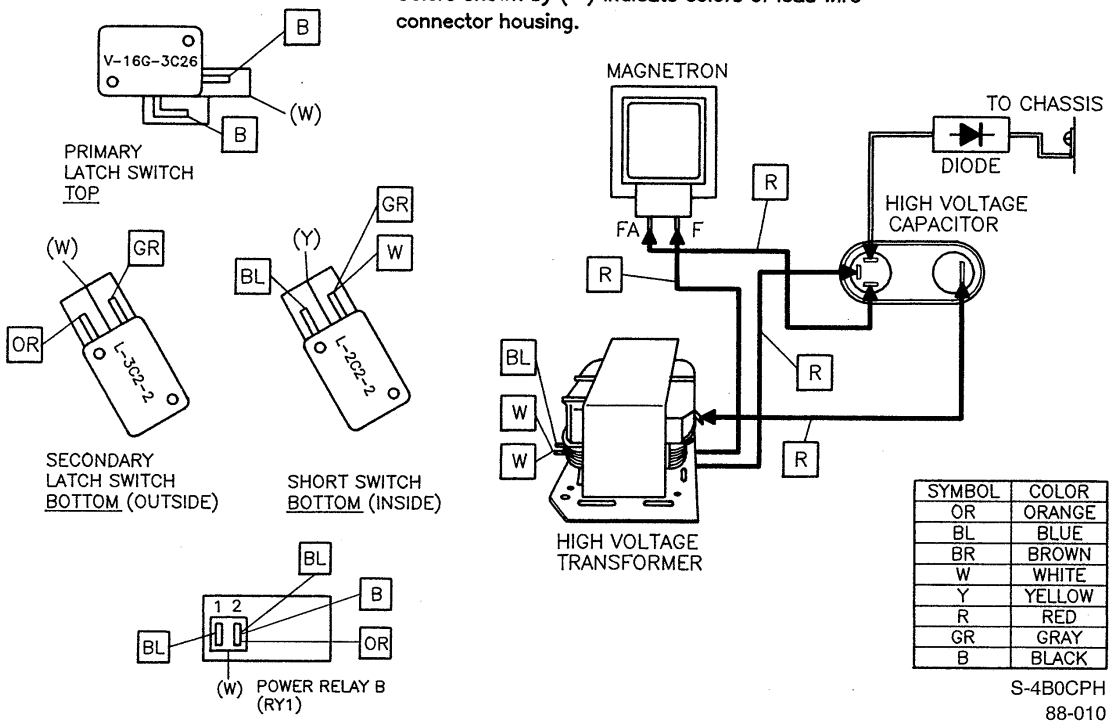

SYMBOL	COLOR
OR	ORANGE
BL	BLUE
BR	BROWN
W	WHITE
Y	YELLOW
R	RED
GR	GRAY
B	BLACK

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DESCRIPTION OF OPERATING SEQUENCE

1. Variable power cooking control

The coil of power relay B (RY1) is energized immediately by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from "Low" to "High" power. One complete ON and OFF cycle of power relay B is 22 seconds. The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

POWER SETTING	OUTPUT POWER (%) APPROX.	ON-OFF TIME OF POWER RELAY B (RY1)	
		ON (SEC)	OFF (SEC)
HIGH	100%	22	0
MEDIUM-HIGH	70%	17	5
MEDIUM	55%	13	9
MEDIUM-LOW	30%	8	14
LOW	10%	5	17
DEFROST	30%	8	14

2. Sensor Cooking

Auto sensor cooking is a revolutionary way to cook by microwave without setting a power level or selecting a time.

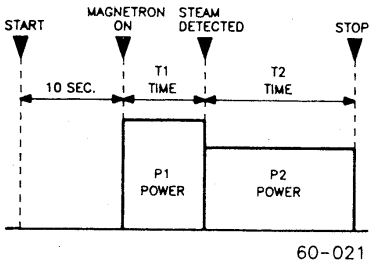
All that is necessary is to select an Auto Sensor Program before starting to cook.

Understanding Auto Sensor Cooking

As the food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto Sensor Cooking, a carefully designed instrument, called the steam sensor element, senses this escape of steam. Then, based upon the Auto Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE: Auto Sensor Cooking is successful with the foods and recipes found in the Auto Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Variable Power Microwave Cookbook for procedures.

AUTO SENSOR COOKING/REHEAT PROCESS



Explanation of the Auto Sensor Cooking process

1) During the first 10 second period there is no microwave activity, and when calculating the T2 time by using the formula below make sure this 10 seconds is subtracted from the T1 time. In other words T1 time starts at the end of the 10 second period.
2) T1 time...The total amount of time it takes the microwave oven to switch to T2 time after the 10 second period.
3) T2 time...When the steam escapes from the cooking container placed in the oven, the steam sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.

Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.

T2 time (in sec.)=T1 time X K factor

NOTE: Remember, the T1 time starts after the 10 second period. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

NOTE: When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds after the 10 second period, and the Auto program selected is Frozen Vegetable:

T2 = T1 X K
= 2 min. and 40 sec. X 0.1
= 160 sec. X 0.1
= 16 sec.

Sensor Cooking

Category	P1 Power	P2 Power	K Factor Standard
Vegetables	HIGH	HIGH	0.1

3. Sensor Reheat

Auto Sensor Reheat is a quick and easy way to reheat refrigerator and room temperature foods.

Simply press the reheat pad. There is no need to select power level and cooking time.

NOTE: The Auto Sensor Reheat process is same as Auto Sensor Cooking process.

Sensor Reheat

Category	P1 Power	P2 Power	K Factor Standard
Sensor Reheat	HIGH	M. HIGH	0.1

CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

CAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.
When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver to discharge.

WARNING

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

WARNING

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

3. When parts must be replaced, remove the power plug from the outlet.

4. When the 18 Amp fuse is blown due to the operation of short switch:

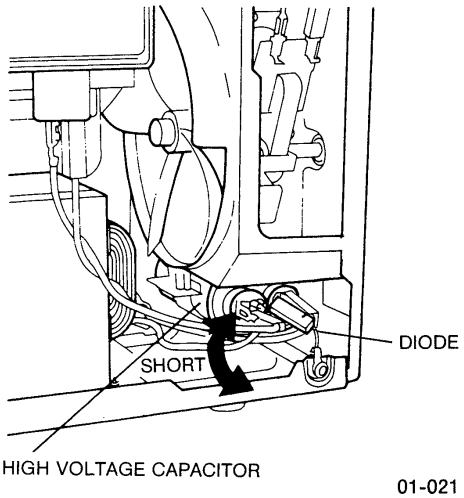
WARNING

When the 18 Amp. fuse if blown due to the operation of the short switch, you must replace power relay B, Primary latch switch and the short switch.

(A) This is mandatory. Refer to "Measurements and Adjustments" for these switches.
(B) When replacing the fuse, confirm that it has the appropriate rating for these models.
(C) When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.



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Touch chassis side first then short to the high voltage capacitor terminal.

6. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.
Microwaves might leak if screws are not properly tightened.
(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
(C) Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage.)

CAUTION

MICROWAVE RADIATION

DO NOT BECOME EXPOSED TO RADIATION FROM THE MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

IMPORTANT NOTICE

1. The following components have potentials above 250V while the appliance is operated.
   - ✻ Magnetron
   - ✻ High voltage transformer
   - ✻ High voltage diode
   - ✻ High voltage capacitor

   Pay special attention on these portions.
2. When the appliance is operated with the door hinges or magnetron fixed incorrectly, the microwave leakage can reach more than 5mW/cm^3. After repair or exchange, it is very important to check if magnetron and the door hinges are correctly fixed.

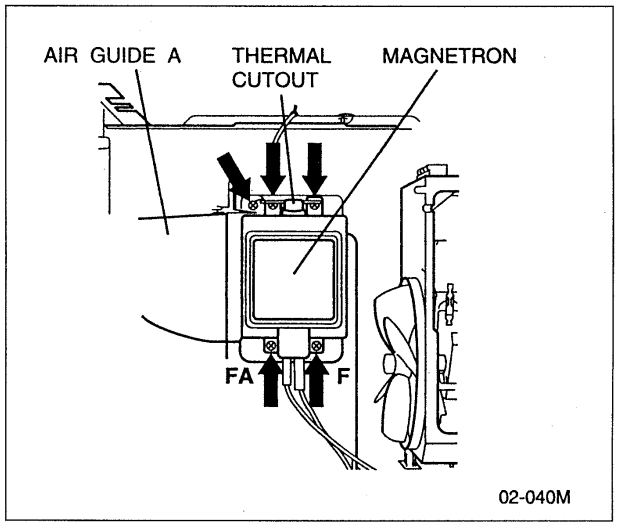
DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

1. Magnetron

(A) Discharge the high voltage capacitor.
(B) Remove 2 screws holding magnetron thermal cutout.
(C) Remove 1 screw holding air guide A.
(D) Disconnect 2 high voltage lead wires from magnetron filament terminals.
(E) Remove 4 screws holding the magnetron.
NOTE: After replacement of the magnetron, tighten mounting screws in an X pattern, properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

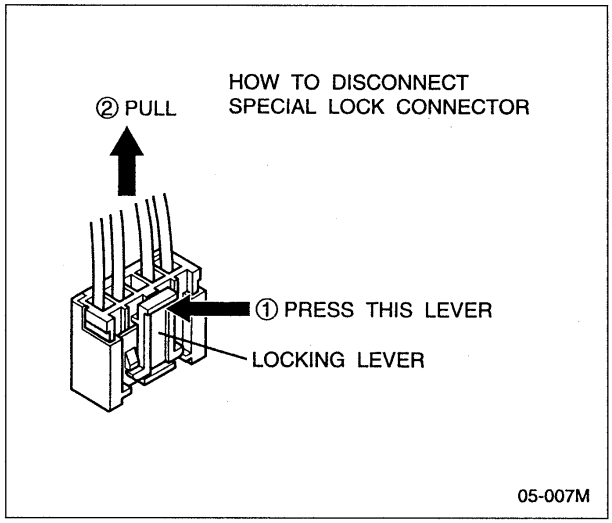
CAUTION
When replacing the magnetron, be sure the antenna gasket is in place.

CAUTION
When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal".



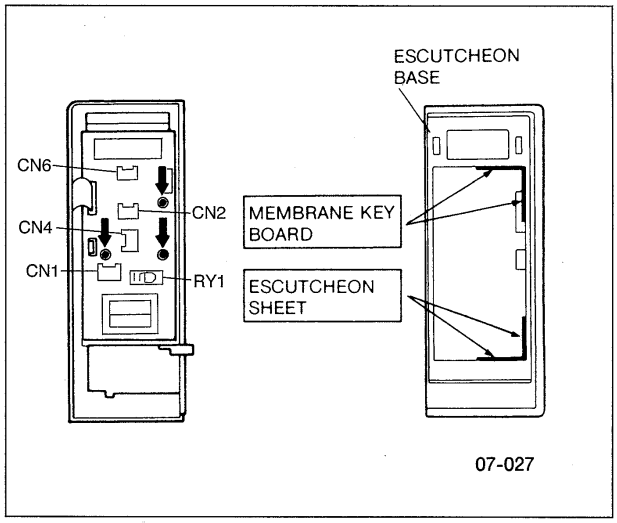
2. Digital Programmer Circuit (DPC) and membrane key board.

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.
(A) Disconnect all connectors from D.P.C.
(B) Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.
(C) Release flat cable connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.
(D) Remove 3 screws holding DPC.
To replace membrane key board (NN-S698 Models)
(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
(F) On these models, the key board is not replaced with individual parts. Instead, the entire escutcheon base assembly must be replaced. Refer to parts list.
To replace membrane key board (NN-N698 Models)
(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
(F) Push the upper part of key board (display window portion) from back of escutcheon base and peel off escutcheon sheet and membrane key board completely from escutcheon base.
NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape. Therefore, applying hot air such as using a hair dryer is recommended for smoother removal.
2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.
3. Alignment position of membrane key board is as follows (see figure);
Membrane key board: Right and upper edges
Escutcheon sheet: Right and lower edges



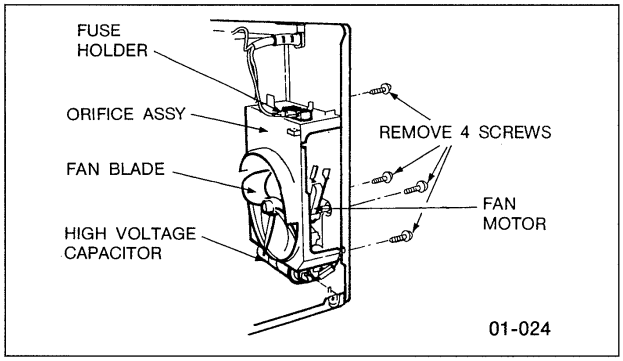
3. Low voltage transformer and/or power relays (RY1, RY2)

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.
(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.
NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.
(B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.



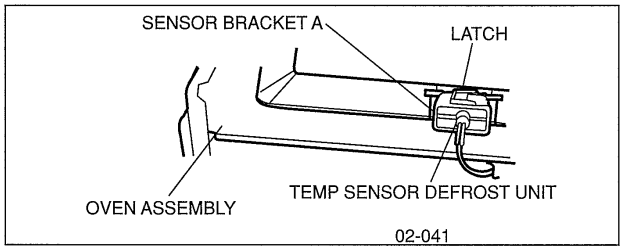
4. Fan motor

(A) Disconnect 2 lead wires from fan motor terminals.
(B) Disconnect 2 lead wires from fuse holder terminals.
(C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.
(D) Remove 4 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.
(E) Remove fan blade from the fan motor shaft by pulling it straight out.
(F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.



5. Temp Sensor Defrost Unit (thermal protector)

(A) Remove cabinet body and unplug lead wire connector of sensor defrost unit.
(B) Lift latch on top of sensor bracket A to release sensor bracket A and sensor defrost unit from oven cavity.
(C) Remove sensor bracket A from sensor defrost unit by lifting back latches and twisting bracket off.

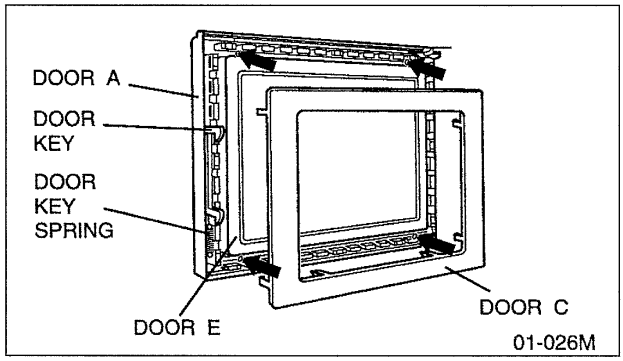


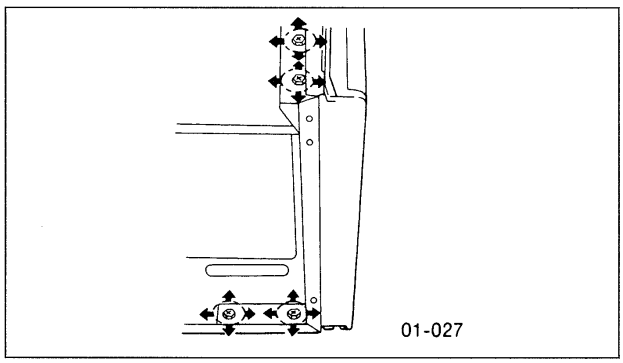
6. Door disassembly

(A) Remove door C from door E by carefully pulling outward starting from upper right hand corner using a flat blade screwdriver.
(B) Remove 4 screws holding door E to door A to separate door E from door A.
(C) Remove door screen B from door A.
(D) Remove door key and door key spring.

After replacment of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

(1) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
(2) Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave power may leak from the clearance between the door and oven.
(3) Perform the microwave leakage test.





7. Turntable motor

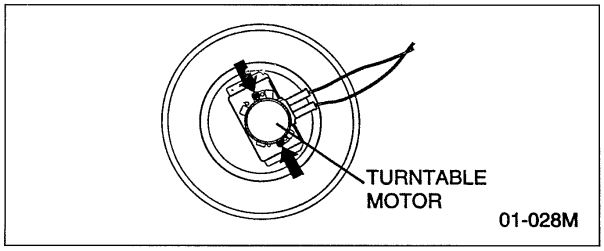
(A) Remove the motor cover by breaking off at the 8 spots indicated by arrows with a cutter or the like. (See Figure)

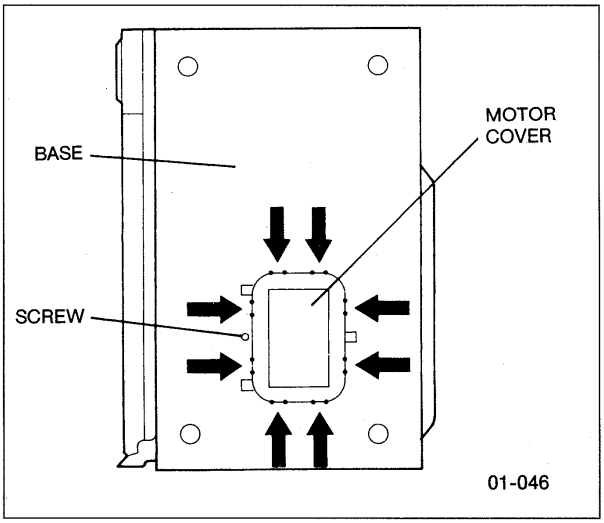
NOTE: After breaking off the motor cover, make sure that cut-off portions are properly trimmed off or bend to inside so that no sharp edge will expose to outside.

(B) Disconnect 2 lead wires connected to the stirrer motor.

(C) Remove the stirrer motor by removing 2 screws.

NOTE: To reinstall the motor cover, use 4X6 screw.





8. Steam Sensor

(A) Remove 1 screw holding steam sensor unit.

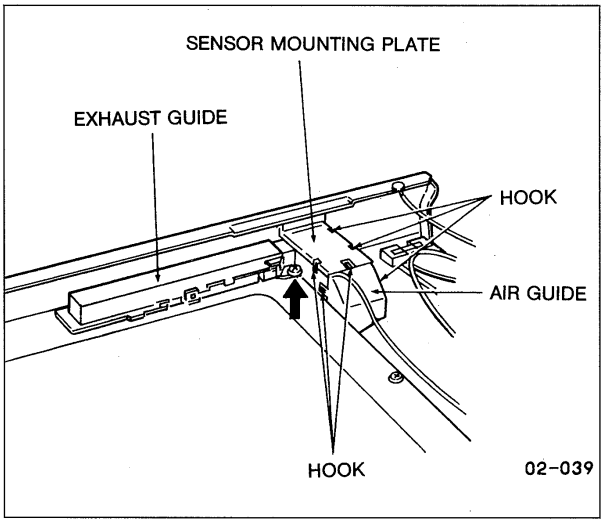
(B) Disconnect CN2 connector from digital programmer circuit board.

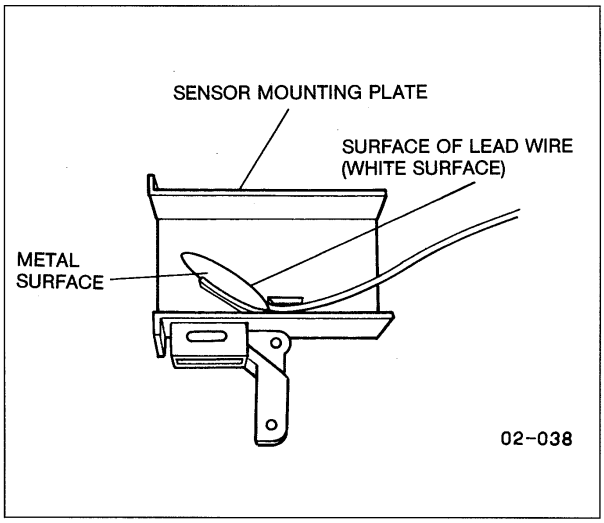
(C) Remove exhaust guide from steam sensor unit.

(D) Remove catch hooks on sensor mounting plate and air guide.

(E) Remove steam sensor from sensor mounting plate.

NOTE: When installing the steam sensor, make sure that the direction of steam sensor is as shown in figure.





COMPONENT TEST PROCEDURE

CAUTION

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

1. Primary Latch Switch, Secondary (Secondary Latch Switch and Power Relay B) Interlocks.

(A) Unplug the lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.
(B) Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
(C) Test the continuity of switches at door opened and closed positions with ohm meter (low scale).
Normal continuity readings should be as follows.

	Door Opened	Door Closed
Primary Latch Switch	∞ Ω (open)	0 Ω (close)
Secondary Latch Switch	∞ Ω (open)	0 Ω (close)
Power Relay B	∞ Ω (open)	∞ Ω (open)

2. Short Switch & Monitor Circuit

(A) Unplug lead wires from H.V. transformer primary terminals.
(B) Connect test probes of ohm meter to the disconnected leads which were connected to H.V. Transformer.
(C) Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.
Normal continuity readings should be as follows.

Door Opened	Door Closed
0 Ω	∞ Ω

3. High voltage transformer

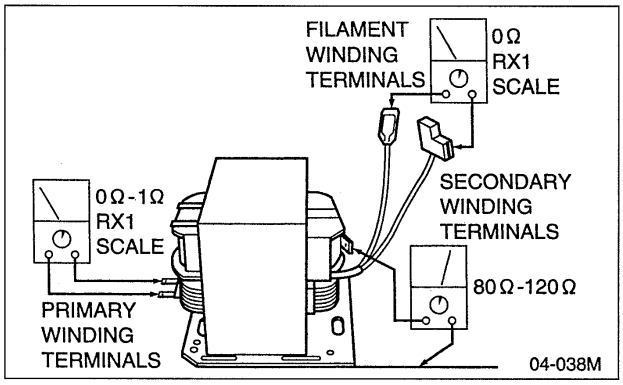
(A) Remove connectors from the transformer terminals and check continuity.
(B) Normal (cold) resistance readings should be as follows:
Secondary winding . . . . . Approx. 80Ω~120Ω
Filament winding . . . . . Approx. 0Ω
Primary winding . . . . . Approx. 0Ω~1Ω

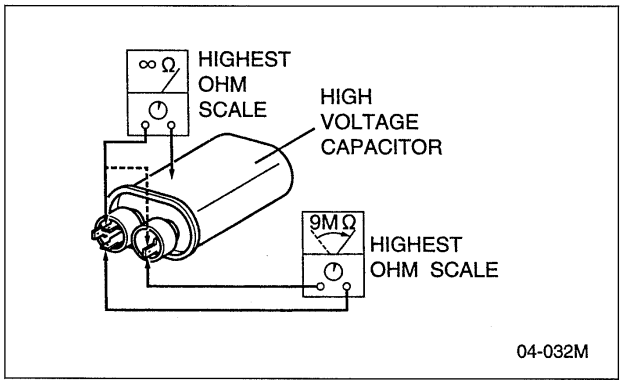
4. High voltage capacitor

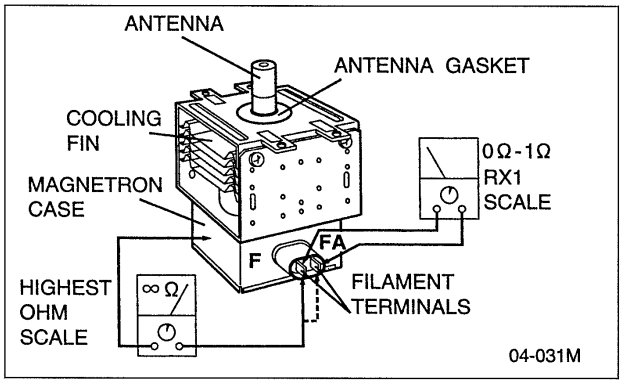
(A) Check continuity of capacitor with meter on highest OHM scale.
(B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
(C) A shorted capacitor will show continuous continuity.
(D) An open capacitor will show constant 9MΩ.
(E) Resistance between each terminal and chassis should be infinite.

5. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.
(A) Isolate magnetron from the circuit by disconnecting the leads.
(B) A continuity check across magnetron filament terminals should indicate one ohm or less.
(C) A continuity check between each filament terminal and magnetron case should read open.

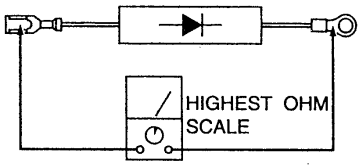






6. Diode

(A) Isolate the diode from the circuit by disconnecting the leads.
(B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.
A normal diode's resistance will be infinite in one direction and several hundred KΩ in the other direction.



NOTE: OHMMETER SHOULD HAVE A MINIMUM 6 VOLT BATTERY.

FORWARD	REVERSE
SEVERAL HUNDRED KΩ	∞ Ω

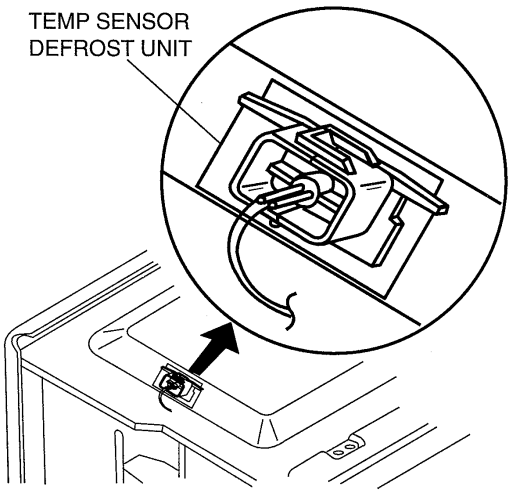
04-033M

7. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

8. Temp Sensor Defrost Unit (Thermal Protector)

These models use one sensor unit for both the sensor defrost and thermal protector functions.
A temp sensor defrost unit is mounted on top of the oven cavity at the left side. Its purpose is to automatically shut off the oven in case the cavity overheats for any reason.
The thermal protector will shut the oven down when the temperature of the cavity reaches 257°F (125°C).
The device is connected to the DPC on touch control models. When the thermal protector exceeds its temperature it will turn off the power to oven cavity and display will go to reset mode.
The cooking program can be reset after cool-down.
THERMISTOR RESISTANCE VALUE
30K-120K at 10°C-30°C (50°F-86°F)



9. Steam Sensor and Digital Programmer Circuit

CAUTION

Do not touch any parts of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel.
Always ground yourself while working on this panel to discharge any static charge built up on your body.

In order to determine if the steam sensor function of the digital programmer circuit is in working order or not, do the following test.

1) Place a water load (150 cc) in the oven.
2) Tap Sensor Reheat pad.
3) Tap Start Pad.
4) Steam Sensor detects steam about 1.5 to 4 minutes after the Start Pad is tapped.
5) T1 time cooking automatically switches to remaining time cooking (T2).
6) The remaining cooking time (T2) appears in display window. If the following cooking time appears, Steam Sensor function is normal.

T1 TIME	T2 TIME (Remaining cooking time)
1 Min. 30 Sec.~4 Min.	8 Sec.~23 Sec.

MEASUREMENTS AND ADJUSTMENTS

WARNING

* For continued protection against radiation hazard, replace only with identical replacement parts (For touch models Part No. ANE6142-1450, Type No. V-16G-3C26-M for Primary latch switch; Part No. A61425180AP, Type No. L-3C2-2 for Secondary latch switch; Part No. A61785180AP, Type No. L-2C2-2 for short switch and Part. No. AEG5J1EG12B/AEG5J1EG18B, Type No. G5J-1-TP for power relay B (RY1))
* When the 18 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. Then follow the installation procedures below.
* Interlock switch replacement — In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

1. Installation of Primary latch switch, Secondary latch switch and Short switch.

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in the illustration.

NOTE: **No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.**

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in the illustration so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

(C) Reconnect the short switch, primary & secondary latch switches and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

2. Measurement of microwave output

The output power of the magnetron can be determined by performing IEC standard test procedures. However, due to the complexity of IEC test procedures, it is recommended to test the magnetron using the simple method outlined below.

Necessary Equipment:

*1 liter beaker *Glass thermometer

*Wrist watch or stopwatch

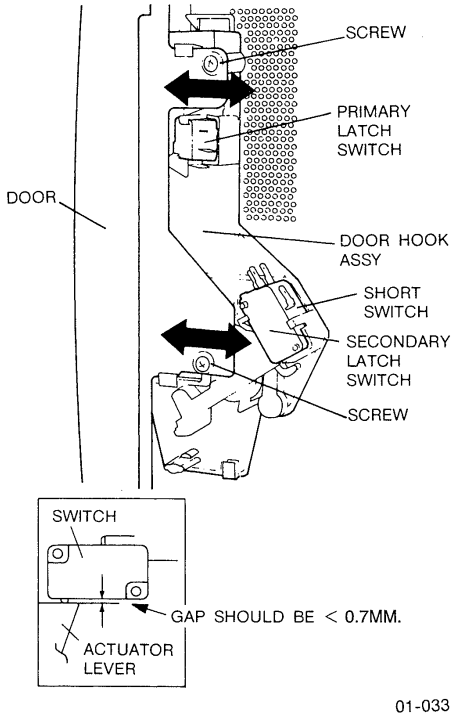
NOTE: **Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.**

(A) Fill the beaker with exactly one liter of tap water. Stir the water using the thermometer and record the beaker's temperature (recorded as T1).

(B) Place the beaker on the center of glass cook plate.
Set the oven for High power and heat it for exactly one minute.

(C) Stir the water again and read the temperature of the beaker (recorded as T2).

(D) The normal temperature rise at High power position for each model is as shown in table.



Please confirm that the gap between the switch housing and switch actuator levers is no more than 0.7 mm when the door is closed.

TABLE (1ℓ-1min. test)

RATED OUTPUT	TEMPERATURE RISE
1000W (IEC705-88)	Min. 15.4°F (8.6°C)
1100W (IEC705-88)	Min. 16.2°F (9.0°C)

PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

WARNING

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm² (1mW/cm² for Canada) inform PASC, PSC, or PCI immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S. and Health and Welfare Canada regulation. This required must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE: **The U.S. Government standard is 5 mW/cm² while in the customer's home. 2 mW/cm² stated here is our own voluntary standard. (1 mW/cm² for Canada)**

1. Equipment

*Electromagnetic radiation monitor
*Glass thermometer 212°F or 100°C
*600cc glass beaker

2. Procedure for measuring radiation leakage.

Note before measuring.

(1) Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.

(2) To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area shown in Figure no faster than 1 inch/sec (2.5 cm/sec).

(3) Leakage with the outer panel removed ..... less than 5mW/cm².

(4) Leakage for a fully assembled oven with door normally closed..... less than 2mW/cm² (1mW/cm² for Canada).

(5) Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door..... less than 2mW/cm².

(A) Pour 275 ± 15cc (9ozs ± 1/2oz) of 20 ±5°C (68 ± 9°F) water in a beaker which is graduated to 600cc, and place in the center of the oven.

(B) Set the radiation monitor to 2450MHz and use it following the manufacturer's recommended test procedure to assure correct results.

(C) When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.

(D) Tap the start pad or set the timer and with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

(1) Measurement with the outer panel removed.

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

WARNING

Avoid contacting any high voltage parts.

(2) Measurements with a fully assembled oven.

After all components, including outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.

3. Record keeping and notification after measurement

(A) After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.

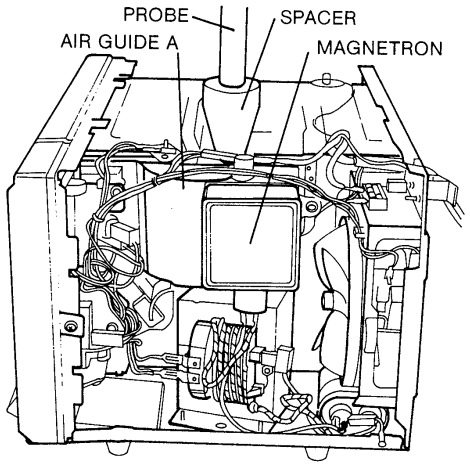
A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.

(B) Should the radiation leakage be more than 2 mW/cm² (1mW/cm² for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify PASC, PSC or PCI.

4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.

WARNING

AVOID CONTACTING ANY HIGH VOLTAGE PARTS.



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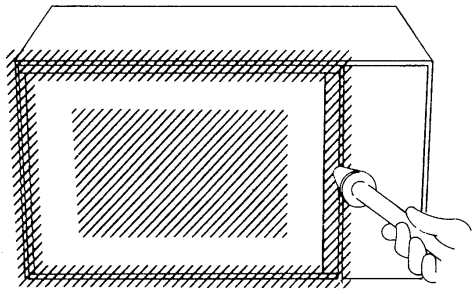

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MOVE PROBE ALONG SHADED AREA (////) AROUND EXHAUST OPENINGS (as shown) AND AROUND AIR INLET OPENING

TROUBLESHOOTING GUIDE

CAUTION

1. Ensure proper grounding before checking for trouble.
2. Be careful of the high voltage circuitry, taking necessary precautions when troubleshooting.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot be removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. 120V AC is present on the digital programmer circuit (Terminals of power relay's and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

Before troubleshooting, operate the microwave oven following the correct operating procedures in the instruction manual in order to find the exact cause of any trouble, since operator error may be mistaken for the oven's malfunction.

	SYMPTOM	CAUSE	CORRECTIONS
1.	Oven is dead. Fuse is OK. No display and no operation at all.	1. Open or loose lead wire harness. 2. Open thermal cutout (Magnetron) 3. Open low voltage transformer 4. Defective DPC	Check fan motor when thermal cutout is defective.
2.	No display and no operation at all. Fuse is blown.	1. Shorted lead wire harness 2. Defective primary latch switch (NOTE 1) 3. Defective short switch (NOTE 1) 4. Shorted H.V. Capacitor 5. Shorted H.V. Transformer (NOTE 2)	Check adjustment of primary, secondary latch switch and short switch including door.
		NOTE 1: All of these switches must be replaced at the same time. (Refer to adjustment instructions.) Check continuity of power relay B's contacts (between 1 and 2) and if it has continuity, replace power relay B also. NOTE 2: When H.V. Transformer is replaced, check diode and magnetron also.	
3.	Oven does not accept key input (Program).	1. Key input is not in sequence 2. Open or loose connection of membrane key pad to DPC (Flat cable) 3. Shorted or open membrane key board 4. Defective DPC	Refer to operation procedure. Refer to DPC troubleshooting.
4.	Oven lamp and fan motor turn on when oven is plugged in with door closed.	1. Misadjustment or loose wiring of secondary latch switch 2. Defective secondary latch switch	Adjust door and latch switches.
5.	Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on)	1. Off-alignment of latch switches 2. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to lower output and/or be intermittent 3. Defective high voltage component H.V. Transformer H.V. Capacitor H.V. Diode Magnetron 4. Open or loose wiring of power relay B 5. Defective primary latch switch 6. Defective power relay B or DPC	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if it is defective. Refer to DPC troubleshooting

	SYMPTOM	CAUSE	CORRECTIONS
6.	Oven can program but timer does not start countdown.	1. Open or loose wiring of secondary latch switch 2. Off-alignment of secondary latch switch 3. Defective secondary latch switch	Adjust door and latch switches.
7.	Microwave output is low. Oven takes longer time to cook food.	1. Decrease in power source voltage 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging change of magnetron	Consult electrician
8.	Fan motor and oven lamp turn on when door is opened.	1. Shorted primary latch switch	Only APH Models
9.	Oven does not operate and return to plugged in mode.	1. Open or loose wiring of temp sensor 2. Defective temp sensor 3. Defective DPC	Check tighten screws on escutcheon base bracket, D.P.C. board and temp sensor. Refer to failure code system.
10.	Loud buzzing noise can be heard.	1. Loose fan and fan motor 2. Loose screws on H.V. Transformer 3. Shorted H.V. Diode	
11.	Sensor defrost cooking does not work properly and defrost cooking time is abnormal. (See NOTE)	1. Open or loose wiring of sensor terminals from DPC. 2. Defective defrost sensor. 3. Defective DPC. (IC1, IC4, IC6)	
12.	Oven return to plugged in mode after 10 seconds elapsed in the auto sensor cooking mode.	1. Open or loose wiring of sensor terminals from DPC. 2. Open steam sensor. 3. Defective D.P.C.	Refer to failure code system.

NOTE:
The following is the maximum time allowed for sensor defrost time.
If defrost time is greater, defrost sensor circuit is defective.

Food Weight	Maximum Allowed Defrost Time	Check Defrost Sensor Circuit
0.5 lb	under 10 min.	over 10 min.
1.0 lb	under 18 min.	over 18 min.
2.0 lb	under 32 min.	over 32 min.
3.0 lb	under 60 min.	over 60 min.

Trouble Related to Digital Programmer Circuit

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No display when oven is first plugged in.	1	Fuse pattern of DPC	Normal	STEP 2
			Open (NOTE)	Shorted Circuit of ZNR, L.V.T., Oven Lamp etc. Replace DPC
	2	Low voltage transformer (LVT) secondary voltage	Abnormal 0V	LVT
			Normal	→ Step 3
	3	IC-1 pin 1 voltage (Emitter of Q1)	Abnormal	ZD1, Q1
			Normal = 5V	→ Step 4
	4	IC-1 pin 27 voltage (14 pin of IC-2)	Abnormal	IC-2
			Normal	→ IC-1, CX1, DISPLAY

NOTE

Procedure of fuse pattern repairing is as follows:

1. When the fuse pattern (PF2) opens.

(1) Remove the jumper wire (PF1).

(2) Insert the removed jumper wire (PF1) to "(PF2)" position and solder it. If both "PF1" and "PF2" fuse patterns are open, please replace DPC.

2. When the fuse pattern (PF4) opens.

(1) Remove the jumper wire (PF3).

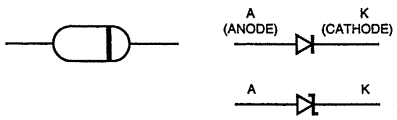
(2) Insert the removed jumper wire (PF3) to "(PF4)" position and solder it. If both "PF3" and "PF4" fuse patterns are open, please replace DPC.

NOTE:* At the time of these repairs, make visual inspection of the varistor for burning damage and examine the transformer with tester for the presence of layer short-circuit (check primary coil resistance).
If any abnormal condition is detected, replace the defective parts.

SYMPTOM	STEP	CHECK	RESULT	CAUSE/CORRECTIONS
No key input	1	Membrane switch continuity	Abnormal	Membrane switch
			Normal	IC-1
No beep sound	1	IC-1 pin 23 voltage	Abnormal	IC-1
			Normal	BZ, Q6
Power relay A(RY-2) does not turn on even though the program has been set and the start pad is tapped	1	IC-1 pin 8 voltage while operation	Abnormal	IC-1,
			Normal = 5V	→ Step 2
	2	Short circuit between pin 1 and pin 12 of IC-2	Still not turn on	RY-2
			RY-2 turns on	IC-2
No microwave oscillation at any power setting	1	IC-1 pin 5 and pin 15 voltages while operation at high power	Abnormal	IC-1
			Normal 5---5V, 15---5V	→ Step 2
	2	Q2 translator	Abnormal	Q2
			Normal	IC-2, RY-1
Dark or unclear display	1	Replace display and check operation	Normal	DISPLAY
			Abnormal	IC-1
Missing or lighting of unnecessary segment	1	Replace IC-1 and check operation	Normal	IC-1
			Abnormal	DISPLAY
TO BE CONTINUED FOR AUTO SENSOR MODELS				
Auto sensor cooking does not operate normally. (Steam Sensor cooking does not detect steam from foods.)	1	Steam sensor terminal voltage by using high impedance tester (20k Ω/V), when breathe on metal surface of sensor	Abnormal = 0V	Steam sensor
			Normal ≥ 10~30mV	IC-1, IC-7

HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

Diode



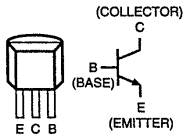
	FORWARD	REVERSE
A-K	SMALL	∞

Transistor

NPN Transistor

2SC·····

2SD·····

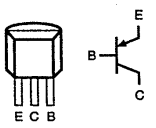


	FORWARD	REVERSE
B-E	SMALL	∞
B-C	SMALL	∞
C-E	∞	∞

PNP Transistor

2SA·····

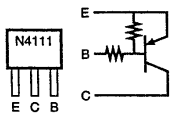
2SB·····



	FORWARD	REVERSE
E-B	SMALL	∞
C-B	SMALL	∞
C-E	∞	∞

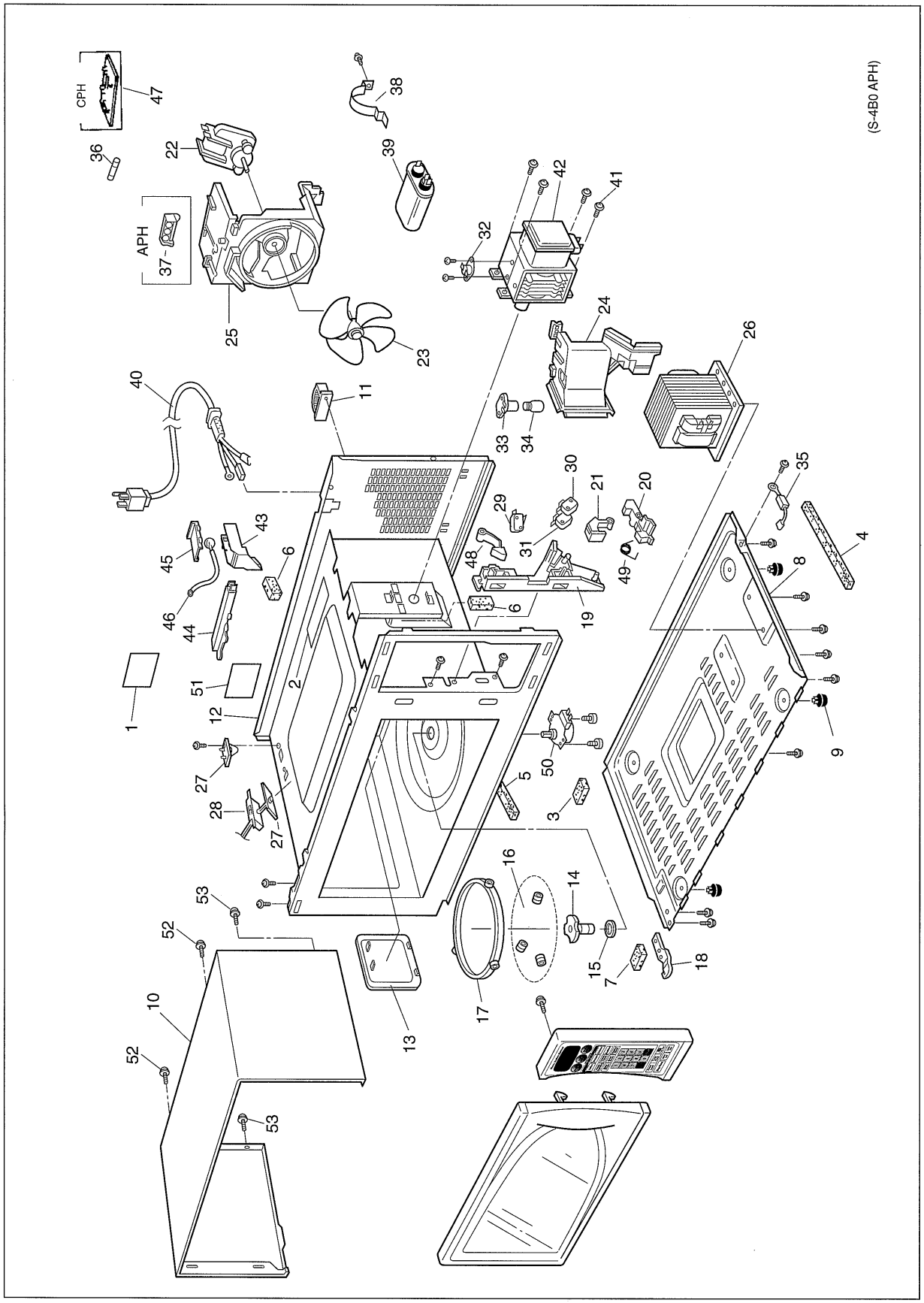
Digital Transistor

PNP Transistor



	FORWARD	REVERSE
E-B	10kΩ~30kΩ	10kΩ~30kΩ
C-B	50kΩ~90kΩ	∞
C-E	40kΩ~80kΩ	∞

EXPLODED VIEW AND PARTS LIST



PARTS LIST

NOTES: • When ordering replacement part(s), please use part number(s) shown in this parts list.
Do not use description of the part.
• Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
• Items marked * supplied by MMOC (MAC). (U.S.A.)
• Items marked # are new Part No's. for Pre I.G. (Initial Guidance) list.

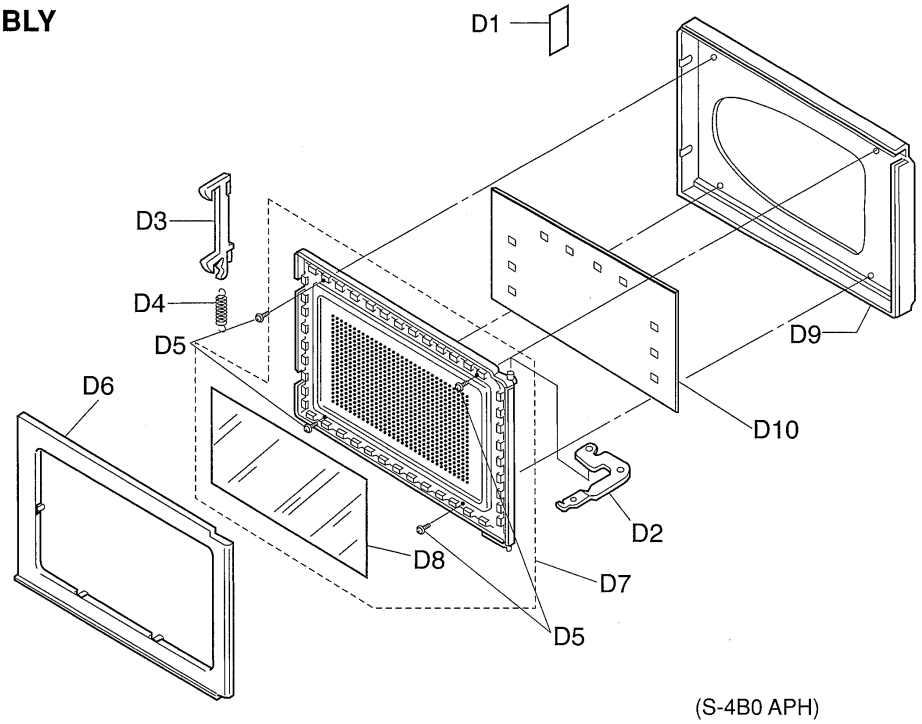
Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*1		B00066260AP	CAUTION LABEL	1	ALL APH MODELS
*1		B00067600CP	CAUTION LABEL	1	ALL CPH MODELS
*2		B00338290AP	FUSE LABEL	1	ALL APH MODELS
*2		B00339250CP	FUSE LABEL	1	ALL CPH MODELS
*3		AMQ0902000BA	CUSHION RUBBER A	1	
*4		AMQ0902000AH	CUSHION RUBBER A	1	
*5		AMQ0928000AT	CUSHION RUBBER A	1	
*6		AMQ0908000AE	CUSHION RUBBER A	1	
*7		AMQ0904000BB	CUSHION RUBBER A	1	
*8		B10018640AP	BASE / 1.3	1	
*9		B10088250AP	RUBBER FOOT	4	
*10		B10097050AP	CABINET BODY / 1.3 / BLACK	1	NN-N698BA, NN-S698BA/BC
*10		B10097050HAP	CABINET BODY / 1.3 / WHITE	1	NN-N698WA, NN-S698WA/WC
*11		B11408760AP	STOPPER A	1	
*12#	⚠	B200A4B00AP	OVEN / 1.3	1	
*13		B20557000AP	CEILING COVER WHITE	1	
*14		B21315540AP	PULLEY SHAFT	1	
*15		B21777050AP	WASHER	1	
*16		B202K9330AP	ROLLER B (U) / 1.3	1	(NOTE 1)
*17		B290D9330AP	ROLLER RING (U) / 1.3	1	
*18	⚠	B30077050AP	LOWER HINGE (B) / 1.3	1	
*19	⚠	B3020-1480	DOOR HOOK A	1	
*20		B3137-1480	HOOK SPACER B	1	
*21		B3138-1480	HOOK SPACER C	1	
*22		2Z-9D0A.S	FAN MOTOR	1	(120V, 24W, AC, SINGLE PHASE)
*23		B40085950AP	FAN BLADE	1	
*24		B40259390AP	AIR GUIDE A	1	
*25		B41448250AP	ORIFICE / 1.3	1	
*26	⚠	B621C4B90AP	H. V. TRANSFORMER	1	NN-N698BA/WA, NN-S698BA/WA (1.5 KVA)
*26	⚠	B621C7050AP	H. V. TRANSFORMER	1	NN-S698BC/WC (1.5 KVA)
*27		A601L9320AP	TEMP SENSOR DEFROST UNIT	1	
*28		B64499320AP	SENSOR BRACKET A	1	
*29	⚠	ANE6142-1450	MICRO SWITCH	1	(V-16G-3C26-M) PRIMARY LATCH SWITCH
*30	⚠	A61425180AP	MICRO SWITCH	1	(L-3C2-2) SECONDARY LATCH SWITCH
*31	⚠	A61785180AP	MICRO SWITCH	1	(L-2C2-2) SHORT SWITCH
*32	⚠	B61456210AP	THERMAL CUTOUT	1	
*33	⚠	B61524740AQ	SOCKET	1	
*34		B60307080AP	INCANDESCENT LAMP	1	
*35	⚠	A62024000AP	DIODE, SI	1	
*36	⚠	B62308250AP	FUSE	1	ALL APH MODELS (18A)
*36	⚠	B62308250AP	FUSE	1	ALL CPH MODELS (18A) (LOCATED ON NOISE FILTER)
*37		B62314000AP	FUSE HOLDER	1	ALL APH MODELS
*38		B61884060AP	CAPACITOR BRACKET	1	
*39	⚠	B60905500AP	H. V. CAPACITOR	1	(1.0 uf, AC 2100V)
*40	⚠	B900C9390AP	AC CORD W/PLUG	1	ALL APH MODELS (120V)
*40	⚠	B900C7630CQ	AC CORD W/PLUG	1	ALL CPH MODELS (120V)
*41		XTT4+8B	SCREW	4	(4X8) FOR MAGNETRON
*42	⚠	2M210-M1F1	MAGNETRON	1	
*43		B64498660AP	SENSOR COVER A	1	
*44		B64508660AP	SENSOR COVER B	1	
*45		B65438660AP	SENSOR COVER C	1	
*46		A607S7050AP	STEAM SENSOR	1	
*47		B692Y7600CP	NOISE FILTER (U)	1	ALL CPH MODELS

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*48		B3136-1480	HOOK SPACER A	1	
*49		J3097-1480	LATCH SPRING	1	
*50		B63264080AP	TURNTABLE MOTOR	1	(3W)
*51		B00064A00AP	SCREW WARNING LABEL	1	ALL APH MODELS
*52		XTW4+12D	SCREW	VARIES	2 FOR APH MODELS, 4 FOR CPH MODELS
*53		XTTANE4T12A	TORX TAMPER RESISTANT SCREW (T20)	2	APH MODELS ONLY (NOTE 1A)
		83335A63	TORX TAMPER RESISTANT DRIVER (T20)	2	APH MODELS ONLY (NOT SHOWN) (NOTE 1A)
*		B08878640AP	TOUCH-UP PAINT (BLACK)	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED CABINET BODY
*		B08878640HAP	TOUCH-UP PAINT (WHITE)	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED CABINET BODY
*		B0887705AAP	CAVITY SPRAY PAINT	1	SPRAY CAN, FOR REPAIR OF PAINTED OVEN CAVITY
*		B0887700AAP	TOUCH-UP PAINT	1	BOTTLE WITH BRUSH, FOR REPAIR OF PAINTED OVEN CAVITY

NOTE 1: When ordering the roller B assy, three rollers will be shipped.
When replacing the roller B, three rollers should be replaced at the same time.
Otherwise the glass cooking tray may not turn smoothly.

NOTE 1A: When repairing unit, special Torx tamper resistant screws are to be removed only by authorized servicers.
To order Torx tamper resistant driver (T20), Part No.83335A63 from supplier, please use the following address.
McMaster-Carr Supply Co.
600 County Line Road
Elmhurst, IL 60126-2081
Mailing Address
P.O. Box 4355
Chicago, IL 60680-4355
Sales & Customer Service Phone No.
(630) 833-0300, FAX (630) 834-9427

DOOR ASSEMBLY

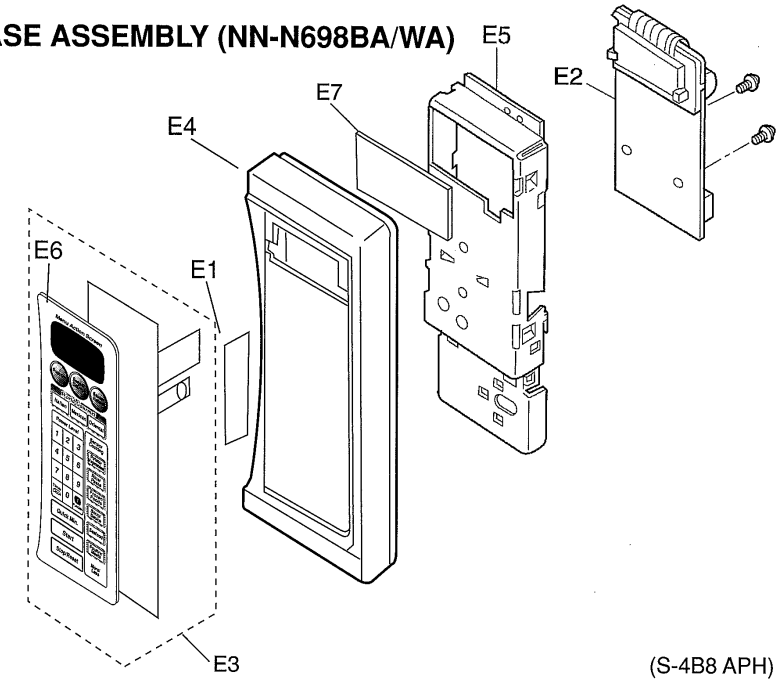


(S-4B0 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*D1		B02454180AP	DHHS LABEL	1	ALL APH MODELS
*D1		B04114180CP	CSA LABEL	1	ALL CPH MODELS
*D2	⚠	B30067050AP	UPPER HINGE (A)	1	
*D3		B3018-1480	DOOR KEY A	1	
*D4		B30214000AP	DOOR KEY SPRING	1	
*D5		XTW3+6Q	SCREW	4	
*D6	⚠	B30858640AP	DOOR C / 1.3 BLACK	1	NN-N698BA, NN-S698BA/BC
*D6	⚠	B30858640HAP	DOOR C / 1.3 WHITE	1	NN-N698WA, NN-S698WA/WC
*D7	⚠	B302K9390AP	DOOR E (U) / 1.3 BLACK	1	NN-N698BA, NN-S698BA/BC
*D7	⚠	B302K9390HAP	DOOR E (U) / 1.3 WHITE	1	NN-N698WA, NN-S698WA/WC
*D8	⚠	B31457050AP	DOOR SCREEN A / 1.3	1	
*D9#	⚠	B301A4B00CP	DOOR A (U) / 1.3 BLACK	1	NN-S698BC (NOTE 2)
*D9#	⚠	B301A4B00HCP	DOOR A (U) / 1.3 WHITE	1	NN-S698WC (NOTE 2)
*D9	⚠	B301A4B00AP	DOOR A (U) / 1.3 BLACK	1	NN-S698BA, NN-N698BA (NOTE 2)
*D9	⚠	B301A4B00HAP	DOOR A (U) / 1.3 WHITE	1	NN-S698WA, NN-N698WA (NOTE 2)
*D10#	⚠	B31464B00APH	DOOR SCREEN B / 1.3	1	NN-N698BA, NN-S698BA
*D10#	⚠	B31464B00CPH	DOOR SCREEN B / 1.3	1	NN-S698BC
*D10	⚠	B31469330HAP	DOOR SCREEN B / 1.3	1	NN-N698WA, NN-S698WA/WC

NOTE 2: Please order Door A and DHHS Label or CSA Label together.

ESCUTCHEON BASE ASSEMBLY (NN-N698BA/WA)

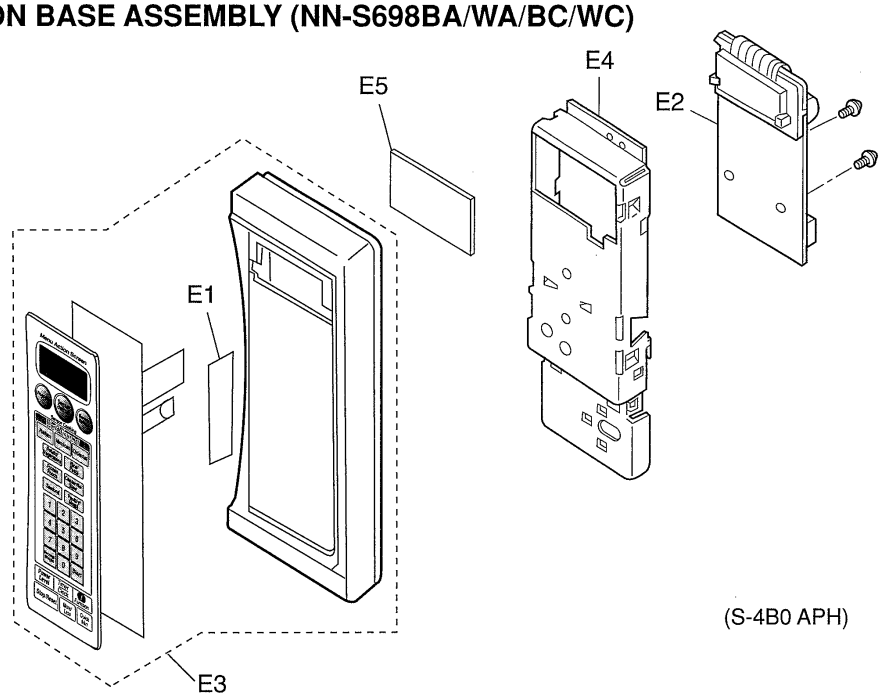


(S-4B8 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*E1		B00078640AP	NAME PLATE	1	
*E2#		B603L4B80AP	D.P. CIRCUIT(U)	1	RTL (W/COMPONENTS)
*E3#		B630Y4B80AP	MEMBRANE SWITCH(U)	1	NN-N698BA (W/ESCUTCHEON SHEET)
*E3#		B630Y4B80HAP	MEMBRANE SWITCH(U)	1	NN-N698WA (W/ESCUTCHEON SHEET)
*E4		B80348660AP	ESCUTCHEON BASE	1	NN-N698BA (NOTE 3)
*E4		B80348660HAP	ESCUTCHEON BASE	1	NN-N698WA (NOTE 3)
*E5		B81278640AP	BACK PLATE	1	
*E6#		B83374B80AP	ESCUTCHEON SHEET	1	NN-N698BA
*E6#		B83374B80HAP	ESCUTCHEON SHEET	1	NN-N698WA
*E7		B80028640AP	DISPLAY LENS	1	

NOTE 3: Please order Escutcheon Base and Name Plate together.

ESCUTCHEON BASE ASSEMBLY (NN-S698BA/WA/BC/WC)

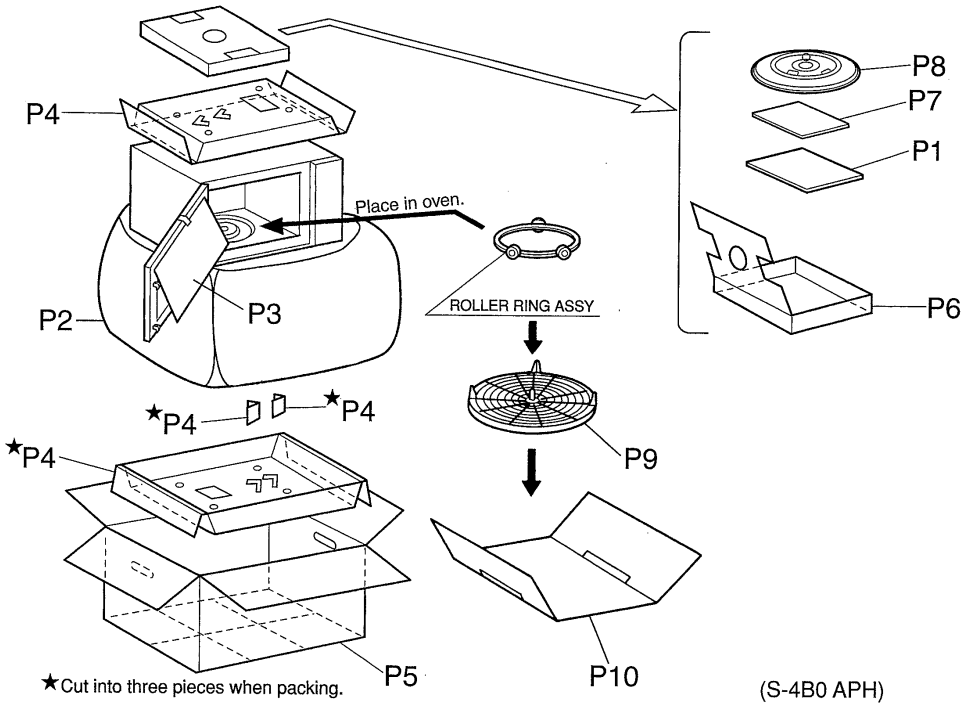


(S-4B0 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*E1		B00078640AP	NAME PLATE	1	NN-S698BA/WA
*E1		B00078640CP	NAME PLATE	1	NN-S698BC/WC
*E2#		B603L4B00AP	D. P. CIRCUIT (U)	1	NN-S698BA/WA RTL (W/COMPONENTS)
*E2#		B603L4B00CP	D. P. CIRCUIT (U)	1	NN-S698BC/WC RTL (W/COMPONENTS)
*E3#		B800L4B00AP	ESCUTCHEON BASE (U)	1	NN-S698BA (NOTE 3)
*E3#		B800L4B00HAP	ESCUTCHEON BASE (U)	1	NN-S698WA (NOTE 3)
*E3#		B800L4B00CP	ESCUTCHEON BASE (U)	1	NN-S698BC (NOTE 3)
*E3#		B800L4B00HCP	ESCUTCHEON BASE (U)	1	NN-S698WC (NOTE 3)
*E4		B81278640AP	BACK PLATE	1	
*E5		B80028640AP	DISPLAY LENS	1	

NOTE 3: Please order Escutcheon Base (U) and Name Plate together.

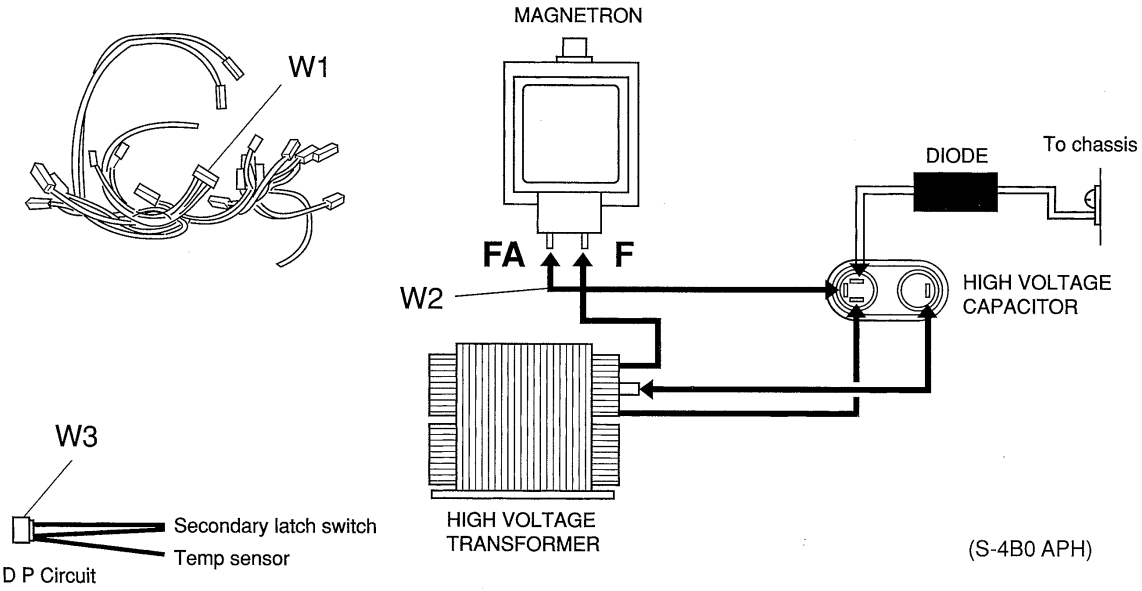
PACKING AND ACCESSORIES



(S-4B0 APH)

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*P1#		B00034B80AP	INSTRUCTION MANUAL	1	NN-N698BA/WA
*P1#		B00034B00AP	INSTRUCTION MANUAL	1	NN-S698BA/WA
*P1#		B00034B00CP	INSTRUCTION MANUAL	1	NN-S698BC/WC
*P1#		B04244B00CP	INSTRUCTION MANUAL (FRENCH)	1	NN-S698BC/WC
*P2		B01068290AP	P. E. BAG	1	
*P3		B01075640AP	DOOR SHEET	1	
*P4		B01837050AP	CORRUGATED FILLER / 1.3	2	
*P5		B010A4B00AP	PACKING CASE / PAPER / 1.3	1	NN-N698BA, NN-S698BA/BC
*P5		B010A4B00HAP	PACKING CASE / PAPER / 1.3	1	NN-N698WA, NN-S698WA/WC
*P6		B02218310AP	UPPER SUPPORT PACKING / 1.3	1	
*P7		B01698310CP	SERVICE CENTER LIST	1	ALL CPH MODELS
*P8		A06014000AP	COOKING TRAY / 1.3	1	
*P9		B07067630AP	DEFROST RACK	1	
*P10		B01087630AP	PACKING CASE	1	

WIRING MATERIALS

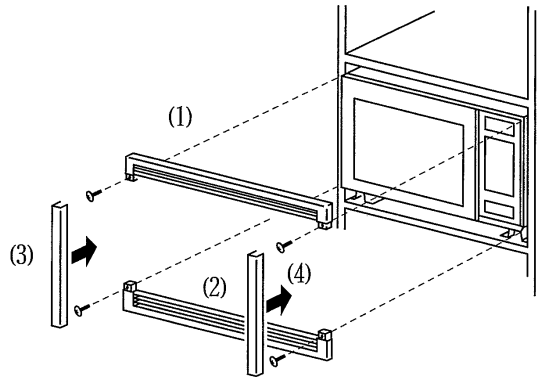


Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
*W1		B030A7600AP	LEAD WIRE HARNESS	1	ALL APH MODELS
*W1		B030A7610CP	LEAD WIRE HARNESS	1	ALL CPH MODELS
*W2		B03508640AP	LEAD WIRE	1	
*W3		B03539320AP	LEAD WIRE	1	

CANADIAN MODELS ONLY

Ref.No.		Part No.	Part Name & Description	Pcs/Set	Remarks
REF NO. 47 NOISE FILTER (U)					
L1		A621A7600CP	FILTER COIL	1	
F1		A62316010BP	FUSE HOLDER	2	
C2, 3	⚠	ECKDNS472MEX	CERAMIC CAPACITOR	2	0.0047MF, 250V, ±20%
C1		ECQU2A104MN	POLYESTER CAPACITOR	1	0.1MF, 250V, ±20%
R1		ERD25FJ564S	CARBON FILM RESISTOR	1	560kOHM, 1/4W, ±5%
ZNR2,3		ERZC10DK112W	VARISTOR	2	

PARTS LIST FOR MICROWAVE OVEN TRIM KITS



Trim kit Model No.	Top and Bottom Strip Ref no:1.2	Pcs/ Set	Side Strip Ref No:3.4	Pcs/ Set	Microwave Oven Model No.
NN-TK608 NN-TK608W	ANE16031J0AP A16031J0HCP	2 2	ANE1601A141AP A1601A141HCP	2 2	NN-S698BC NN-S698WC

NOTE: The top and bottom strips have the same part number and the left and right side strips also have the same part number. These parts will be supplied on one piece per one part number.

DIGITAL PROGRAMMER CIRCUIT

PARTS LIST

Note: Items marked * are supplied by MMOC (MAC). (U.S.A.)
Note: Items marked # are new Part No's. for Pre I.G. (Initial Guidance) list.

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS	REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
BZ1	AEFB22EP20TL	BUZZER	1	2.0KHZ	IC7*	AEHMH705	IC	1	
C10	ECEA1VU471E	ELECTROLYTIC CAPACITOR, AL.	1	470μF/35V/±20%					
C11	ECA1VM101B	ELECTROLYTIC CAPACITOR, AL.	1	100μF/50V/±20% NN-N698BA/WA, NN-S698BC/WC	Q1	2SD2006QRTA	TRANSISTOR, SI, 1.2W	1	(120MHZ)
					Q2	2SC1318QSTA	TRANSISTOR	1	NN-S698BA/WA BC/WC
C14	ECA1CM220B	ELECTROLYTIC CAPACITOR, AL.	1	22μF/16V/±20%	Q3	UN4219-(TA)	TRANSISTOR, SI, 300MW	2	
C15,18,34,36, 39-41, 50	AECBT50F103Z	CERAMIC CAPACITOR	8	0.01μF/25V/ -20%+80%	Q4	UN4111-(TA)	TRANSISTOR, SI, 400MW	1	(150MHZ) NN-S698BA/WA/ BC/WC
C16	ECA1HM101B	ELECTROLYTIC CAPACITOR	1	100μF/50V/±20% NN-S698BA/WA/ BC/WC	Q5#	UN421F-(TA)	TRANSISTOR	1	NN-S698BA/WA/ BC/WC
C17	ECA1HM220B	ELECTROLYTIC CAPACITOR	1	22μF/50V/±20% NN-S698BA/WA/ BC/WC	Q6	2SD1991AQSTA	TRANSISTOR	1	
					R10,11	ERDS2TJ151T	CARBON FILM RESISTOR	2	150Ω, 1/4W, ±5%
					R13	ERDS2TJ152T	CARBON FILM RESISTOR	1	1.5KΩ, 1/4W, ±5% NN-S698BA/WA/ BC/WC
C19,29,35, 38,42,43,52	AECF50F104Z	CERAMIC CAPACITOR	7	0.01μF/50V/-20%+80%					
C45-49	AECBE50X682T	CERAMIC CAPACITOR	5	68μF/16V/-20%+80%	R12,46-56	ERDS2TJ103T	CARBON FILM RESISTOR	18	10KΩ, 1/4W, ±5%
C21,22,23	ECBT1H101KB5	CERAMIC CAPACITOR	3	NN-N698BA/WA	61,65,69,				NN-S698BA/WA
C21,22,23,27, 30-33	ECBT1H101KB5	CERAMIC CAPACITOR	8	0.01μF/50V/ -20%+80% NN-S698BA/WA/ BC/WC	70,87,88				
					R12,52-56,61, 65,69,70,87,88	ERDS2TJ103T	CARBON FILM RESISTOR	12	10KΩ, 1/4W, ±5% NN-S698BC/WC
C37	ECEA1HKA2R2B	ELECTROLYTIC CAPACITOR	1	2.2μF/50V/±20%	R12,61,65	ERDS2TJ103T	CARBON FILM RESISTOR	7	10KΩ, 1/4W, ±5%,
CN1	AEEMMF01505W	CONNECTOR	1	5PIN	69,71,87,88				NN-N698BA/WA
CN2	AEEMMF00703W	CONNECTOR	1	3PIN					
CN3,5	AEEM12FDZBTM	CONNECTOR	2	4PIN RED					
CN4	AEEMMF00D04W	CONNECTOR	1	4PIN	R14,15,16	ERDS2TJ472T	CARBON FILM RESISTOR	3	47KΩ, 1/4W, ±5%
CN6	AEEMMF00703R	CONNECTOR	1		R17	ER0S2TKF4642	METAL FILM RESISTOR	1	
CX1	EF0EC6004T4	CERAMIC RESONATOR	1	4.19MHz	R45,60	ERDS2TJ102T	CARBON FILM RESISTOR	2	1KΩ, 1/4W, ±5%
D10,11,12	AEDNERA1502	DIODE, SI	3	(1A)	R44,62	ERDS2TJ332T	CARBON FILM RESISTOR	2	3.3KΩ, 1/4W, ±5%,
D14,26,27, 30,33-37,45	MA196-(TA5)	DIODE, SI	10	0.1A NN-S698BA/BC/ WA/WC	R44,58,59,62	ERDS2TJ332T	CARBON FILM RESISTOR	4	NN-N698BA/WA 3.3KΩ, 1/4W, ±5%, NN-S698BA/WA/ BC/WC
D14,30, 33-37,45	MA-196-(TA5)	DIODE, SI	8	0.1 A NN-N698BA/WA					
					R63,64	ERDS2TJ330T	CARBON FILM RESISTOR	2	33KΩ, 1/4W, ±5%
D29	MA700-(TA)	DIODE, SI	1	(0.03A) NN-N698BA/WA, NN-S698BA/WA	R74-84,86	ERDS2TJ104T	CARBON FILM RESISTOR	12	100KΩ, 1/4W, ±5%
D29,38,39,40	MA700-(TA)	DIODE, SI	4	(0.03) NN-S698BC/WC					
D38-40#	AEDNRB721Q	DIODE, SI	3	NN-N698BA/WA, NN-S698BC/WC	RY1 ⚠	AEG5J1EM12B	POWER RELAY	1	(12V)
					RY2 ⚠	AEBGG5N1A18	POWER RELAY	1	(18V)
DISP1*	AEFR6LT147GN	FLUORESCENT TUBE	1		SP1*	B82849410AP	DISPLAY HOLDER	1	FOR DISPLAY
IC1*#	AEIC38121424	L.S.I.	1	NN-N698BA/WA	T1	ETP41KDN41ZU	TRANSFORMER	1	
IC1*#	AEIC38121417	L.S.I.	1	NN-S698BA/WA	ZD1,2	AEDZ5R6ES2T1	ZENER DIODE,SI	2	RD5.6ES-AB2
IC1*#	AEIC38121422	L.S.I.	1	NN-S698BC/WC	ZD4,5	AEDZ13ES2T1	ZENER DIODE, SI	2	RD20ES-AB3
IC2*	AN6752	IC	1						NN-S698BA/WA/ BC/WC
IC4*	MN8591	IC	1	NN-S698BA/WA/ BC/WC	D43	ERZV10D471CS	VARISTOR	1	10K, 470V
IC6*	AEICTLC1549C	IC	1		D41	ERZV10D112C1	VARISTOR	1	

SERVICE FIXTURES AND TOOLS

EXTENSION CABLES

NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
	AT40P003	3 pin Extension Cable	1	Cable No. 48
	AT40P004	4 pin Extension Cable	1	Cable No. 47
	AT40P005	5 pin Extension Cable	1	Cable No. 46
	AT40E006	1 pinX6 Extension Cable	1	Cable No. 9

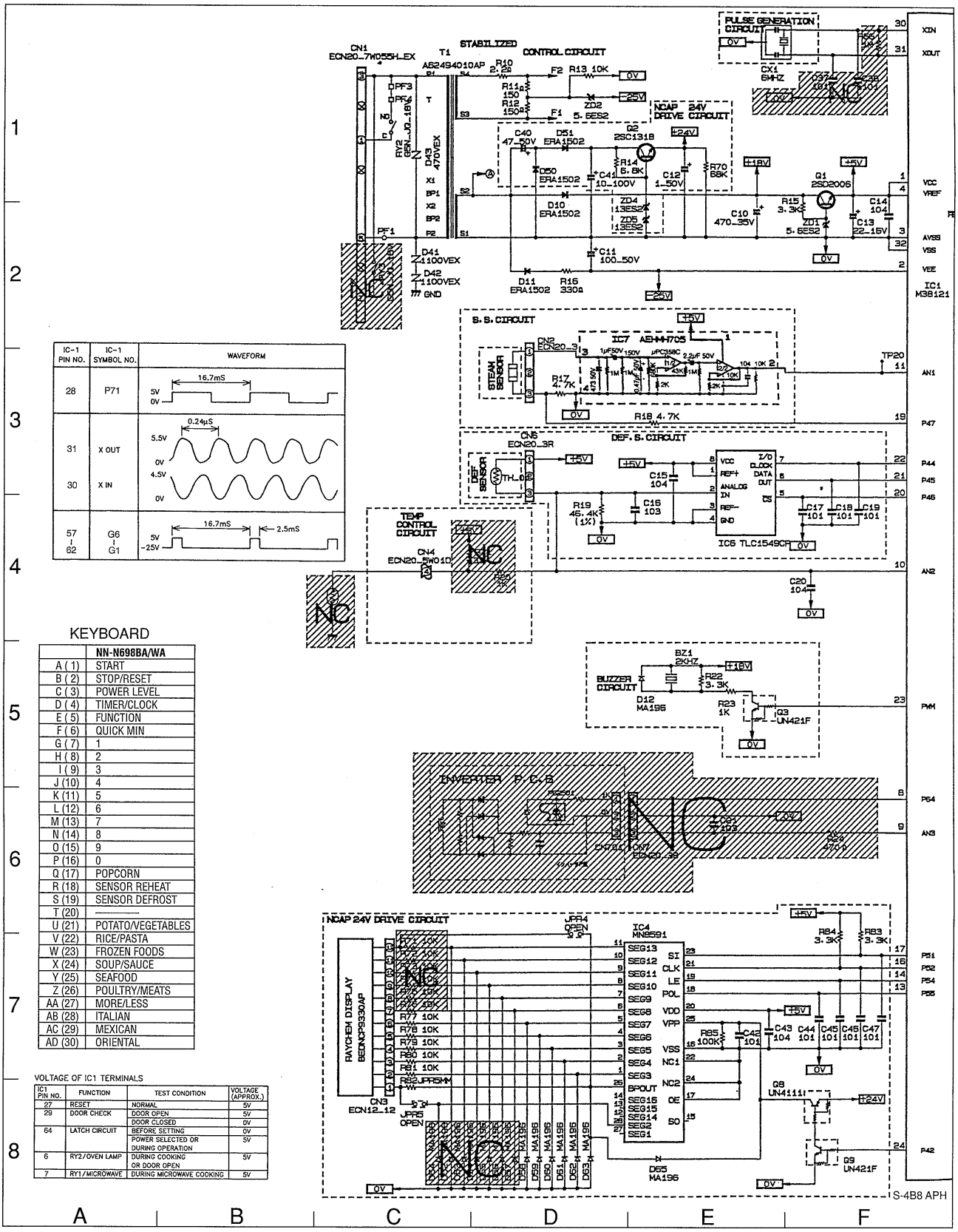
DPC COMMON CHECKER AND ITS CABLE

NOTE: To be used only when DPC common checker is available.

REF No.	PART NO.	DESCRIPTION	QTY	REMARKS
	ANE600ZK70AP	DPC. Common Checker	1	
	AT30A7020AP	DPC. Checker Cable	1	NOTE

DIGITAL PROGRAMMER CIRCUIT (NN-N698BA/WA)

SCHEMATIC DIAGRAM



IC-1 PIN NO.	IC-1 SYMBOL NO.	WAVEFORM
28	P71	16.7mS, 5V, 0V
31	X OUT	0.24μS, 5.5V, 0V
30	X IN	4.5V, 0V
57 ~ 62	G6 ~ G1	16.7mS, 2.5mS, 5V, -25V

KEYBOARD

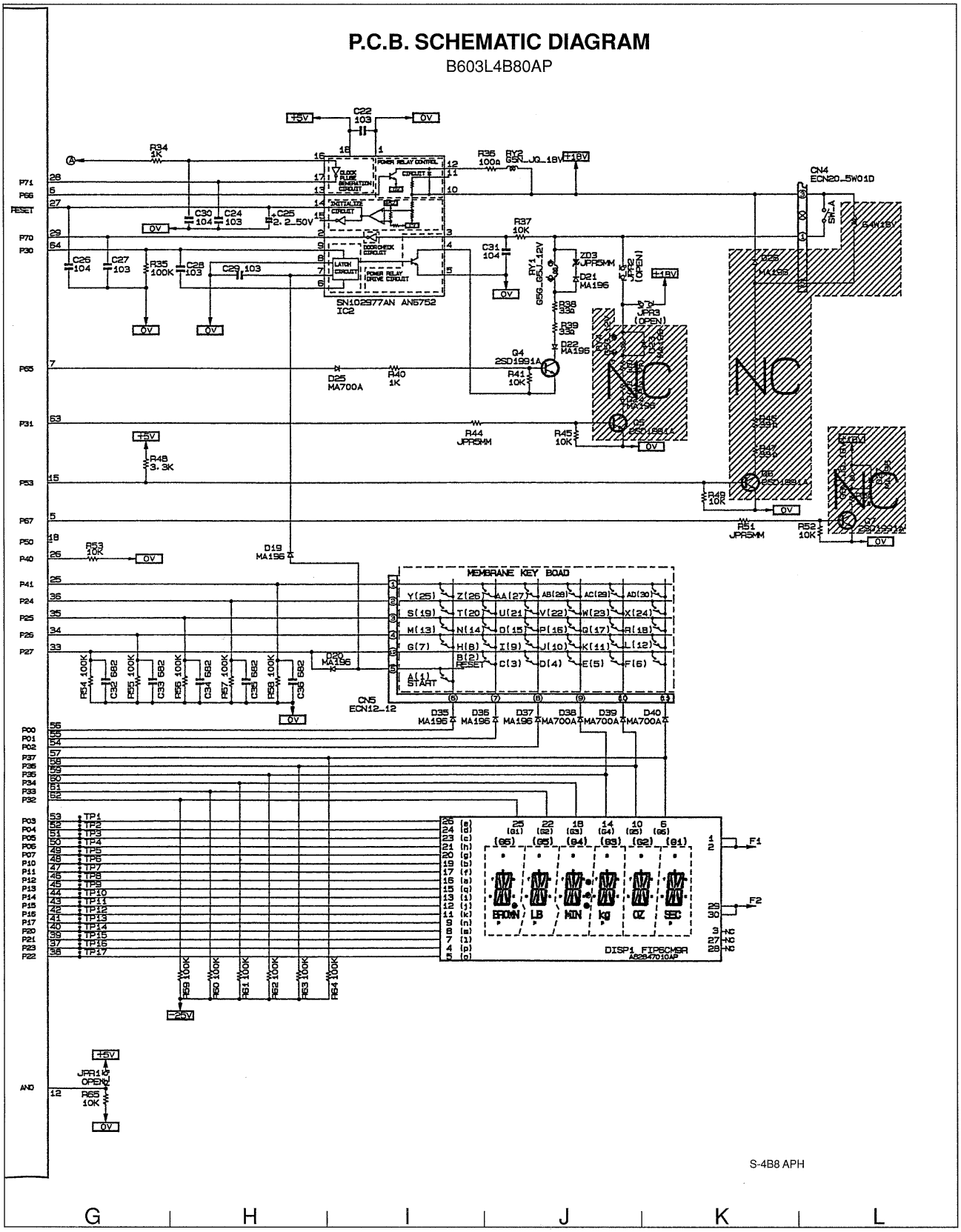
	NN-N698BA/WA
A (1)	START
B (2)	STOP/RESET
C (3)	POWER LEVEL
D (4)	TIMER/CLOCK
E (5)	FUNCTION
F (6)	QUICK MIN
G (7)	1
H (8)	2
I (9)	3
J (10)	4
K (11)	5
L (12)	6
M (13)	7
N (14)	8
O (15)	9
P (16)	0
Q (17)	POPCORN
R (18)	SENSOR REHEAT
S (19)	SENSOR DEFROST
T (20)	———
U (21)	POTATO/VEGETABLES
V (22)	RICE/PASTA
W (23)	FROZEN FOODS
X (24)	SOUP/SAUCE
Y (25)	SEAFOOD
Z (26)	POULTRY/MEATS
AA (27)	MORE/LESS
AB (28)	ITALIAN
AC (29)	MEXICAN
AD (30)	ORIENTAL

VOLTAGE OF IC1 TERMINALS

IC1 PIN NO.	FUNCTION	TEST CONDITION	VOLTAGE (APPROX.)
27	RESET	NORMAL	5V
29	DOOR CHECK	DOOR OPEN	5V
		DOOR CLOSED	0V
64	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V
6	RY2/OVEN LAMP	DURING COOKING OR DOOR OPEN	5V
7	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V

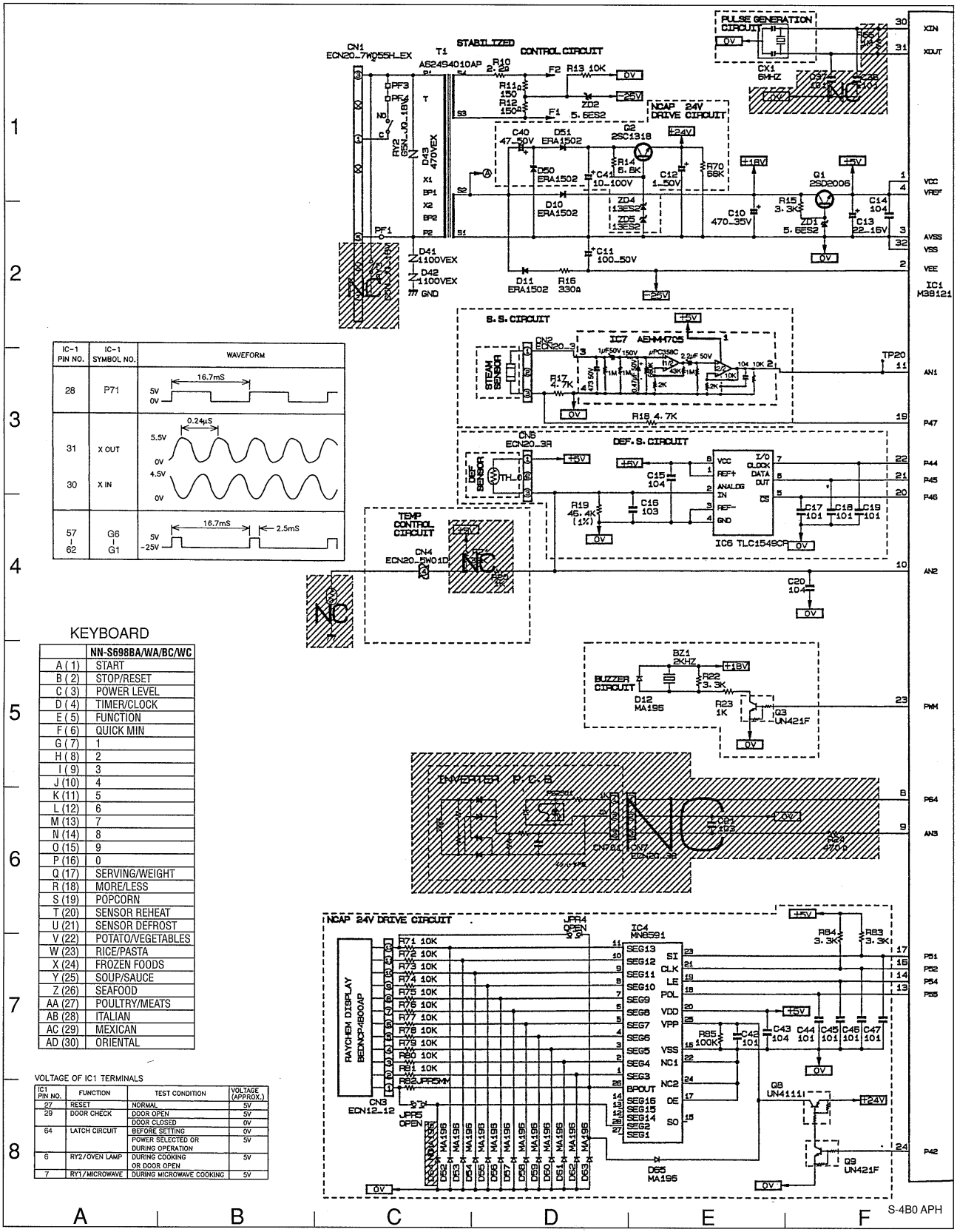
P.C.B. SCHEMATIC DIAGRAM

B603L4B80AP



DIGITAL PROGRAMMER CIRCUIT (NN-S698BA/WA/BC/WC)

SCHEMATIC DIAGRAM



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57 ~ 62	G6 ~ G1	16.7mS, 2.5mS, 5V, -25V

KEYBOARD

	NN-S698BA/WA/BC/WC
A (1)	START
B (2)	STOP/RESET
C (3)	POWER LEVEL
D (4)	TIMER/CLOCK
E (5)	FUNCTION
F (6)	QUICK MIN
G (7)	1
H (8)	2
I (9)	3
J (10)	4
K (11)	5
L (12)	6
M (13)	7
N (14)	8
O (15)	9
P (16)	0
Q (17)	SERVING/WEIGHT
R (18)	MORE/LESS
S (19)	POPCORN
T (20)	SENSOR REHEAT
U (21)	SENSOR DEFROST
V (22)	POTATO/VEGETABLES
W (23)	RICE/PASTA
X (24)	FROZEN FOODS
Y (25)	SOUP/SAUCE
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		DOOR CLOSED	0V
64	LATCH CIRCUIT	BEFORE SETTING	0V
		POWER SELECTED OR DURING OPERATION	5V
6	RY2/OVEN LAMP	DURING COOKING OR DOOR OPEN	5V
7	RY1/MICROWAVE	DURING MICROWAVE COOKING	5V

P.C.B. SCHEMATIC DIAGRAM

B603L4B00AP